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3330 E01

MISA
Municipal/Industrial Strategy for Abatement

ACUTE LETHALITY DATA FOR ONTARIO'S ELECTRICAL POWER GENERATION SECTOR EFFLUENTS COVERING THE PERIOD FROM JUNE TO NOVEMBER 1990

Ontario

ISBN 0-7778-0164-7

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January 1995

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PIBS 3330E01

ACUTE LETHALITY DATA FOR ONTARIO'S ELECTRIC POWER GENERATION SECTOR EFFLUENTS COVERING THE PERIOD FROM JUNE TO NOVEMBER 1990

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January 1995

Erratum

All references in this document to "WTP Neutral Sump" or "Waste Treatment Plant Neutral Sump" should read **Water Treatment Plant Neutralization Sump.**

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Decew Falls, Welland
Sir Adam Beck 2 Generating Station, Queenston

Atikokan Thermal Generating Station, Atikokan
Lakeview Thermal Generating Station, Mississauga
Lennox Thermal Generating Station, South Fredericksberg
Lambton Thermal Generating Station, Courtright
Nanticoke Thermal Generating Station, Nanticoke
R.L Hearn Thermal Generating Station (mothballed), Toronto
Thunder Bay Thermal Generating Station, Thunder Bay

Bruce Nuclear Generating Station - A, Tiverton
Bruce Nuclear Generating Station - B, Tiverton
Darlington Nuclear Generating Station, Bowmanville
Pickering Nuclear Generating Station - A, Pickering
Pickering Nuclear Generating Station - B, Pickering

Bruce Heavy Water Plant, Tiverton
Bruce Nuclear Power Development - Services A&B, Tiverton
Chalk River Nuclear Laboratories, Chalk River
Darlington NGS - Construction, Bowmanville

SUMMARY

Under the Municipal/Industrial Strategy for Abatement program the Electric Power Generation Sector facilities were required to monitor their liquid effluents (both process and cooling waters) for acute lethality to rainbow trout and *Daphnia magna*. This requirement was based on provisions in the Environmental Protection Act which allows the Ministry to write regulations requesting that persons responsible for sources of contamination monitor, record and report to the Ministry. Specific details of the testing and reporting requirements are identified in the General Effluent Monitoring Regulation (Ontario Regulation 695/88), and in the Effluent Monitoring Regulations for the Electric Power Generation Sector (Ontario Regulation 726/89). The rational for the monitoring requirements can be found in the Development Document for the Effluent Monitoring Regulation for the Electric Power Generation Sector (Env. Ont. 1990). The monitoring data will be used, in part, to develop effluent limits for acute toxicity. This report is a compilation of the results from the first six months of toxicity tests submitted by the companies, and from audit samples tested by the Aquatic Toxicity Unit at the Ministry laboratory in Rexdale. Most facilities involved in this regulation voluntarily submitted data for their intake water streams, and this information is included.

Acute lethality tests are simple, rapid methods for measuring potential impacts on aquatic life. The regulations require the companies to conduct these test following standard procedures (Protocol to Determine the Acute Lethality of Liquid Effluents to Fish (Craig *et. al.* 1983)) and the *Daphnia magna* Acute Lethality Toxicity Test Protocol (Poirier *et. al.* 1988)). In these tests aquatic organisms are exposed to undiluted effluent, and a series of effluent dilutions for a fixed period of time. The Ministry protocols require a 96 hour exposure period for trout and 48 hours for *Daphnia*. An LC50, the concentration of effluent estimated to cause 50% of the test animals to die, was calculated, where possible, for each sample. This statistic (48 h LC50) and its associated confidence limits are used as the measure of toxicity of the effluent samples.

These acute lethality toxicity tests will detect harmful concentrations and mixtures of most chemical constituents of effluents, but compliance with end-of-pipe limits for acute toxicity will not necessarily control all potential adverse environmental effects. Sublethal and chronic effects on growth, reproduction and behaviour, and genotoxic effects may occur at concentrations orders of magnitude lower than acute effects. There is also potential environmental effects caused by the loading of bioaccumulative substances. These substances are usually non-polar organic chemicals of high molecular weight and low solubility, or metals such as mercury, which can accumulate in its organic forms,

or cadmium, which can cause permanent damage at sublethal levels accumulating over the lifespan of the animal.

The monitoring regulations required the companies to conduct acute lethality toxicity tests using rainbow trout and *Daphnia magna* on samples from selected discharge points. The collection of samples for toxicity testing coincided with the collection of samples for chemical characterization, also required under these regulations. The frequency of sampling was monthly for process effluent streams, and quarterly for once-through cooling water streams. There was a provision that allowed a company to revert to single concentration trout testing on any process stream in which less than 2 fish die in any test in three consecutive samples. The company reverts to full dilution series testing if more than two fish die in any single concentration test. There was no such provision for *Daphnia* testing.

Over the first six months of monitoring , the 17 facilities submitted toxicity results for 339 samples collected from 106 discharge points. In addition there were results for 69 intake water samples, and 35 Ministry audit tests (Table 1). In general, the reporting from this sector went smoothly with data arriving in a timely fashion and few reports returned for correction. Presently there are 13 outstanding samples. Some of these samples were not tested due to high radiation counts at time of sampling, and others were not collected because the plant was not in operation in that month.

General

The Electric Power Generation Sector in Ontario consists of 86 generating stations and associated facilities. This sector was divided into four subgroups for ease of setting regulations:

1) **Hydraulic Generating Stations:** Hydraulic plants use the energy of falling water to rotate turbines, which in turn drive electric generators. Sixty-eight of these stations are presently operated by Ontario Hydro. Since there are no raw materials in use to generate electricity in these plants, only 2 stations were selected for monitoring.
2) **Thermal Generating Stations:** Thermal stations use high pressure steam, produced by burning fossil fuels such as coal, oil and natural gas, to rotate turbines which in turn drive the electrical generators. There are six operational and two mothballed thermal generating stations in Ontario. The combustion of fossil fuels produces a variety of process byproducts therefor seven of these eight plants have been included in the monitoring regulation.
3) **Nuclear Generating Stations:** The CANDU type nuclear stations in operation in Ontario use the fission of uranium 235 to generate heat. Heavy water transfers heat to high-purity, demineralized boiler water. The steam

Table 1 Summary of Sampling for Toxicity Testing for the Electric Power Generation Sector, June to November 1990.

Subsection	No. Outfalls	No. Effluent Samples	No. Ministry Audits	No. Intake Samples	No. Lethal Samples
Daphnia					
Hydraulic G.S.	4	8	0	4	0
Fossil Fuelled T.G.S.	49	148	18	35	78
Nuclear G.S.	36	113	7	21	29
Facilities Associated with N.G.S.	18	73	10	8	22
Trout					
Hydraulic G.S.	4	6	0	3	0
Fossil Fuelled T.G.S.	49	145	18	37	37
Nuclear G.S.	36	113	7	21	33
Facilities Associated with N.G.S.	18	72	10	8	17

Table 2: Summary of Acute Toxicity of Electric Power Generation Sector Effluents to Rainbow Trout and Daphnia magna June to November 1990

			Sampling Site				
Thermal G.S.	**W.T.P. Neutral. Sump**	**Boiler Blowdown**	**Oily Water Separator**	**Ash (Lagoon) Transport**	**Coal Pile Effluent**		**Intake**
Atikokan	^{A}1/6^B *1/6*	2/6 *5/6*	0/6 *0/6*	0/6 *1/6*	N/A *N/A*		0/5 *0/5*
Lakeview	1/1 *1/1*	6/10 *9/10*	1/13 *3/13*	1/7 *1/7*	0/6 *0/6*		0/6 *0/6*
Lambton	N/A	3/5 *5/5*	N/A	0/6 *0/6*	N/A		0/6 *0/6*
Lennox	0/7 *0/7*	3/7 *7/7*	0/7 *0/7*	N/A *N/A*	N/A *N/A*		0/6 *0/6*
Nanticoke	N/A *N/A*	6/8 *8/8*	N/A *N/A*	(4/6)-0/1 *(5/6)-0/1*	N/A *N/A*		0/6 *0/6*
Thunder Bay	6/7 *6/7*	3/7 *6/7*	0/7 *0/7*	0/7 *0/7*	N/A *N/A*		0/6 0/6
Nuclear G.S.	**W.T.P. Neutral. Sump**	**Boiler Blowdown**	**Oily Water Separator**			**Radio-active Liquid Waste**	**Intake**
Bruce A	6/6 *6/6*	1/6 *1/6*	N/A *N/A*			2/4 *2/4*	0/4 *0/4*
Bruce B	1/7 *0/6*	1/7 *0/7*	N/A *N/A*			0/6 *2/6*	0/6 *0/6*
Darling.	5/6 *2/5*	1/7 *0/7*	0/6 *0/6*			2/6 *2/6*	0/5 *0/5*
Pickering	1/6 *1/7*	9/11 *11/12*	1/10 *0/11*			1/6 *2/6*	0/6 *0/6*

A - # Samples lethal
B - # Samples tested
T/T - Rainbow Trout
D/D - *Daphnia magna*
N/A - Not applicable

from the boilers turns the turbines, which in turn drives the electrical generators. The process effluents from a nuclear generating station are different than those from a fossil fuelled generating station. There are four operational nuclear stations in Ontario situated at two complexes and using a total of 16 CANDU reactors. A third complex is under construction in Bowmanville and a portion of this complex was operational during the monitoring regulations. All these facilities are included in the monitoring regulation.

4) **Facilities Associated with Nuclear Power Generation:** These facilities include a plant for heavy water production, waste storage and treatment facilities and nuclear research laboratories. Chalk River Laboratories is a unique research facility operated by Atomic Energy of Canada Ltd., and is included in this group for ease of comparison. Three other plants were included in the monitoring regulations.

A more thorough overview of Ontario's Electric Power Generation Sector can be found in the development document for the effluent monitoring regulation for the electric power generation sector (Env. Ont. 1990).

Toxicity Test Results

The following is a description of the outfalls which were consistently toxic to rainbow trout and/or *Daphnia magna* during the sampling period. An attempt was made to compare chemistry data with toxicity data to give possible explanations for the toxicity of the outfalls. In most cases there was sufficient chemistry information to make an evaluation, but in some instances there was insufficient data, or there was no obvious explanation for the observed biological effects. The most consistently toxic sampling sites were plotted to demonstrate any trends in toxicity.

The data summaries include only basic summaries of all the toxicity data submitted during the monitoring program. The complete data set resides in Ministry's toxicity relational database system (Environment Ontario 1989) and is available upon request. The comment fields were entered by the industry's laboratory performing the tests and should not be expected to be consistent across samples, and do not necessarily represent the views of the Ministry.

Hydraulic Generating Stations

There were no trout or *Daphnia* mortalities in any toxicity test conducted on samples from the two hydraulic generating stations monitored in the MISA regulations. This may be a consequence of there not being any chemical processes utilized in producing electricity in this manner.

Thermal Generating Stations

Generally, the toxic effluents from the Thermal Generating Stations were from three sites: 1) the Boiler Blowdown effluents, 2) Waste Treatment Plant Neutral Sumps, and 3) the Ash Lagoons or Ash Transport Systems (primarily at Nanticoke TGS).

Boiler Blowdown effluents tended to be most consistently toxic to both trout and *Daphnia*. Out of the 40 boiler blowdown effluents tested for six thermal generating stations, 21 were lethal to trout and 38 were lethal to *Daphnia*. Boiler blowdown effluents have low conductivities (< 20 uS/cm) and hardness. This creates stress on aquatic organisms as they attempt to maintain an internal ionic balance against a steeper environmental gradient. In laboratory tests, low hardness or ionic strength seldom kill fish, though the test animals do show some signs of stress (dark pigmentation, increased mucous secretion). The low hardness also influences the toxicity of most metals, making them more toxic. During the tests, all fish tended to die in the undiluted effluent (100% concentration), but few if any died in the next lowest concentration (usually 65 or 80% effluent). The 96 h LC50 values were mostly > 80% effluent in these cases. For trout much of the toxicity of the effluents could be attributed to a combination of their very low ionic strength and hardness, and low concentrations of various metals, including copper, zinc, aluminum, strontium and selenium. There were also a few samples with moderate concentrations of ammonia and cyanide.

Daphnia was more sensitive to boiler blowdown effluents than trout. In only a few cases did it appear that low ionic strength was the major contributor to toxicity. In laboratory tests, *Daphnia magna* exposed to 100% distilled or deionized water (very low ion concentration) die. A dilution of 90% distilled:10% dilution water was sufficient to remove all toxicity. Generally, with boiler blowdown effluents this was not the case. The LC50 values were often < 75%, which indicates that some other factors may be contributing to toxicity. It appears that various combinations of low hardness, high pH, heavy metals (Al, Cr, Cu, Sr, Zn), ammonia and cyanide may be contributing to toxicity. Ammonia and cyanide may be present due to the use of hydrazine as an antioxidant in some facilities. Atikokan TGS (Figure 1) had moderately low conductivity (10 - 20 uS/cm), but on occasion had concentrations of total ammonia > 1.5 mg/L, and Cu > 50 ug/L. Lakeview TGS typically had conductivity < 10 uS/cm, pH > 9 and Cu > 50 ug/L. Lambton TGS was typified by conductivity < 25 uS/cm, pH > 8.5, and Cu concentrations up to 3.3 mg/L (100 times the LC50 to Daphnia). Lennox TGS had very low conductivity (< 10 uS/cm), Cu up to 328 ug/L, and on one occasion cyanide = 5.38 mg/L. Boiler blowdown effluents from Nanticoke TGS typically had very high pH (> 9.1), low conductivity (<30 uS/cm) and moderately low copper concentrations (40 - 115 ug/L). Boiler blowdown effluents from Thunder Bay GS had low conductivity (< 16 uS/cm), pH between 8.5

and 10, low ammonia concentrations (0.14 - 0.53 mg/L), low copper concentrations (10 - 20 ug/L), and on occasion oil and grease between 5 and 7.5 mg/L. None of these individual factors are typically toxic at these levels, but combine each may contribute to the whole effluent toxicity.

Waste Treatment Plant Neutral Sump samples were acutely lethal to trout and *Daphnia*. Of the 21 samples collected from three thermal generating stations, 14 were lethal to trout and 8 were lethal to *Daphnia*. Samples from Thunder Bay TGS was consistently toxic. Samples from Thunder Bay GS (Figure 2) had extremes in pH (either > 10.5 or < 2.3) and moderate to high concentrations of copper (30 - 620 ug/L), aluminum (> 150 ug/L) and strontium (>100 ug/L). The one Ministry audit sample from Lakeview TGS was taken from upstream of the final treatment.

Four of six samples from the Ash Lagoon at Nanticoke TGS (Figure 3) were lethal to trout and five of six samples were lethal to *Daphnia*. pH was always > 9 and mostly > 10, Al concentrations often exceeded 1 mg/L, Sr > 1.3 mg/L and Se > 25 ug/L. The toxicities of Al and Sr vary greatly with hardness and pH. Ash tansport systems at other sites were non-lethal.

Nuclear Generating Stations

Toxic samples from the four nuclear generating stations were primarily from three sampling points: 1) Boiler Blowdown Effluents, 2) Waste Treatment Plant Neutral Sumps, and 3) Radioactive Liquid Waste Management (***RLWM) Tanks, though the toxicity of these outfalls varied significantly between facilities.

Almost 50% of Waste Treatment Plant Neutral Sump samples were toxic to trout and *Daphnia*, and these samples were among the most toxic in this sector with LC50 values as low as 1.9% effluent (Figure 4 & 5). The samples from these sites typically had variable pH (range 1.5 to 10.5), high suspended solids concentrations, and moderately high concentrations of Cu, Zn, and Al.

Boiler Blowdown samples from Bruce NGS A and B, and from Darlington NGS were toxic to trout in 3 of 20 samples and to Daphnia in 1 of 18 samples. In all cases there was 100% mortality in the 100% effluent concentration and no animals dead in the next lowest concentration. Also, a large number of samples from these plants had LC50s > 100%, with only a few animals dead in the 100% concentration. A review of the chemistry data indicated no other compounds at sufficient concentration to cause mortalities. These results suggest that ionic stress is the most likely cause of toxicity in these three samples. Conversely, boiler blowdowns from Pickering NGS A&B were toxic to trout in 9 of 11 samples and to Daphnia in 11 of 12 samples. Low ionic strength, combined with some heavy metals (Al, Pb, Zn) may be the cause of toxicity in these samples.

There were a few samples (30%) from the ***RLWM Tanks from each NGS which were toxic to trout and *Daphnia*, but toxicity was variable with LC50s ranging from 2.9 % effluent to non-lethal. Toxic samples consistently had high concentrations of heavy metals (Cu > 150 ug/L, Zn > 150 ug/L), and ammonia (> 1 mg/L). Copper and ammonia levels are up to 10 times greater than the LC50 values generated in this laboratory or reported in the literature.

Facilities Associated with Nuclear Power Generation

The toxicity of effluent samples from these four facilities was as variable as the facilities themselves, but the toxic samples were from the same types of outfalls as the toxic samples from the thermal generating stations and the nuclear generating stations (ie. Sewage Treatment Plant/ STP Neutral Sumps/ Sanitary Sewers, and Boiler Blowdowns).

There were no toxic samples from the Bruce Heavy Water Plant in Tiverton, and only three toxic samples from Bruce Nuclear Power Development Services A&B. The Sewage Treatment Plant sample was toxic to both trout and *Daphnia* and ammonia levels up to 6.5 mg/L. One sample from each of the WTP neutral Sump and CE Blowdown A Lake was toxic only to *Daphnia*, but the cause of toxicity was unknown.

Fifty percent of the samples from Chalk River Nuclear Laboratories were toxic to trout and/or Daphnia. All six samples from the sanitary sewer were acutely lethal to both test species (Figure 6). The pH levels from this outfall were below 5.7, ammonia concentrations were greater than 5.4 mg/L, and Cu concentrations were above 50 ug/L. One sample from the Waste Treatment Centre also was toxic to both species. Concentrations of ammonia (75.8 mg/L), Cu (279 ug/L), and Zn (1.15 mg/L) were all above the cited LC50 values for both species. One sample from the Power House (PH) Drain was toxic to trout. This sample had a pH = 9.6, which may have contributed to its toxicity.

At Darlington - Construction, samples toxic to trout and *Daphnia* came from the TRF Boiler Blowdown (Figure 7), Boiler Blowdown Effluent (Figure 8), and Sewage Treatment. WTP Neutral Sump samples were toxic only to *Daphnia* (Figure 9). The TRF Boiler Blowdown samples generally had low ionic strength and high Cu (> 100 ug/L). The Boiler Blowdown effluents had low conductivities, very high pH (>10.5), Cu up to 400 ug/L and ammonia up to 880 ug/L. The WTP Neutral Sump samples were variable with 4 of 7 samples toxic to *Daphnia* and no samples toxic to trout. The pH ranged from 1.8 to 7.6, conductivity from 250 to 100000 uS/cm, Cu from 24 to 152 ug/L, cyanide from below detection limits (N.D.) to 5.3 mg/L, and total phenolics from N.D. to 3.7 mg/L. All these factors could be involved in the toxicity of the samples as they are above or nearing cited LC50 values.

Conclusions

In general *Daphnia magna* was more sensitive to Electric Power Generation Effluents, particularly Boiler Blowdown effluents than were trout, although on a few occasions the reverse was true. Boiler Blowdown effluents generated more toxic samples than the other sampling sites, but they were seldom the most toxic. The most toxic samples (ie. lowest LC50s) were from the WTP Neutral Sumps. This relationship held true despite the process type.

Toxicity appears to be caused by combinations of chemical and physical factors. For Boiler Blowdown samples, toxicity was related to a combination of low conductivities (< 20 uS/cm), high pH values (> 9) and moderately high concentrations of Cu (> 50 ug/L), Al (> 500 ug/L) and/or Zn (> 100 ug/L). Occasionally ammonia and cyanide were at lethal levels in these outfalls. For WTP Neutral Sump samples toxicity was related to various causes: low pH (< 3), high concentrations of heavy metals, ammonia, cyanide, phenolics or suspended solids - or a combination of the above. Toxicity of *** RLWM Tank samples appear to be related to high concentrations of Cu (> 200 ug/L) and Zn (> 150 ug/L). Toxic Ash Lagoon and Ash Transport Line samples had high concentrations of heavy metals and high pH (up to 11.0).

It is possible that toxicity of some of these effluents could be due to chlorine present in the discharge. Some of these facilities have requested permission to use chlorine in their intake pipes to prevent zebra mussels from clogging their water distribution systems. Effluent from sanitary sewers must be sterilized, and the method of choice is chlorine addition. Chlorine data was submitted for only a few sites, and results are inconclusive.

References

Craig, G., K. Flood, J. Lee, and M. Thomson. 1983. Protocol to determine the acute lethality of liquid effluents to fish. Queen's Printer for Ontario. 9 pp.

Environment Ontario. 1989. Toxicity relational database system, TOXDATA. Queen's Printer for Ontario. 42 pp.

Environment Ontario. 1990. The development document for the effluent monitoring reguletion for the electric power generation sector. Queen's Printer for Ontario. 62 pp.

Poirier, D.G., G.F. Westlake, and S.G. Abernathy. 1988. Daphnia magna acute lethality toxicity test protocol. Queen's Printer for Ontario. 11 pp.

Figure Captions

Figure 1: The acute toxicity of Boiler Blowdown (300) Effluent samples collected from Atikokan TGS to trout and Daphnia.

Figure 2: The acute toxicity of WTP Neutral Sump (1500) effluent samples collected from Thunder Bay GS to trout and Daphnia.

Figure 3: The acute toxicity of Ash Lagoon (100) effluent samples collected from Nanticoke TGS to trout and Daphnia.

Figure 4: The acute toxicity of WTP Neutral Sump (2000) effluent samples collected from Bruce NGS A to trout and Daphnia.

Figure 5: The acute toxicity of WTP Neutral Sump (2200) effluent samples collected from Darlington NGS to trout and Daphnia.

Figure 6: The acute toxicity of Sanitary Sewer (500) effluent samples collected from Chalk River Nuclear Laboratories to trout and Daphnia.

Figure 7: The acute toxicity of TRF Boiler Blowdown (100) effluent samples collected from Darlington Construction to trout and Daphnia.

Figure 8: The acute toxicity of Boiler Blowdown (200) effluent samples collected from Darlington Construction to trout and Daphnia.

Figure 9: The acute toxicity of WTP Neutral Sump (1100) effluent samples collected from Darlington Construction to trout and Daphnia.

Figure 1.
Atikokan TGS
Boiler Blowdown (300)

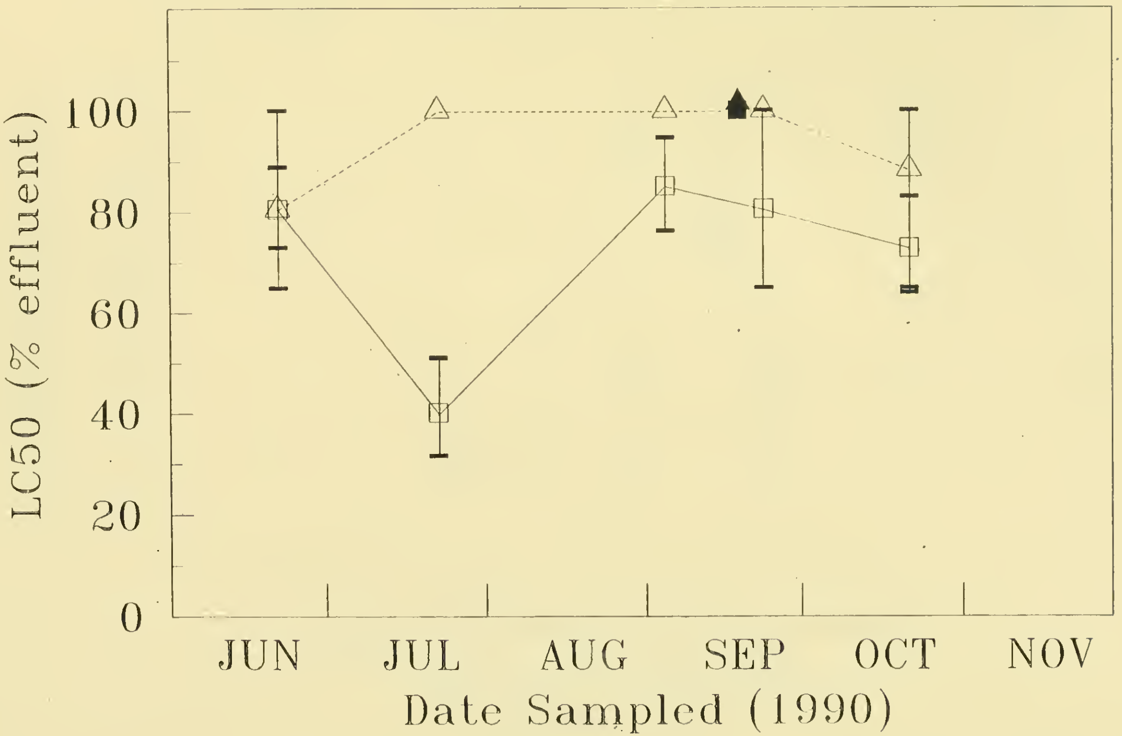


Figure 2 .

Thunder Bay GS
WTP Neutral Sump (1500)

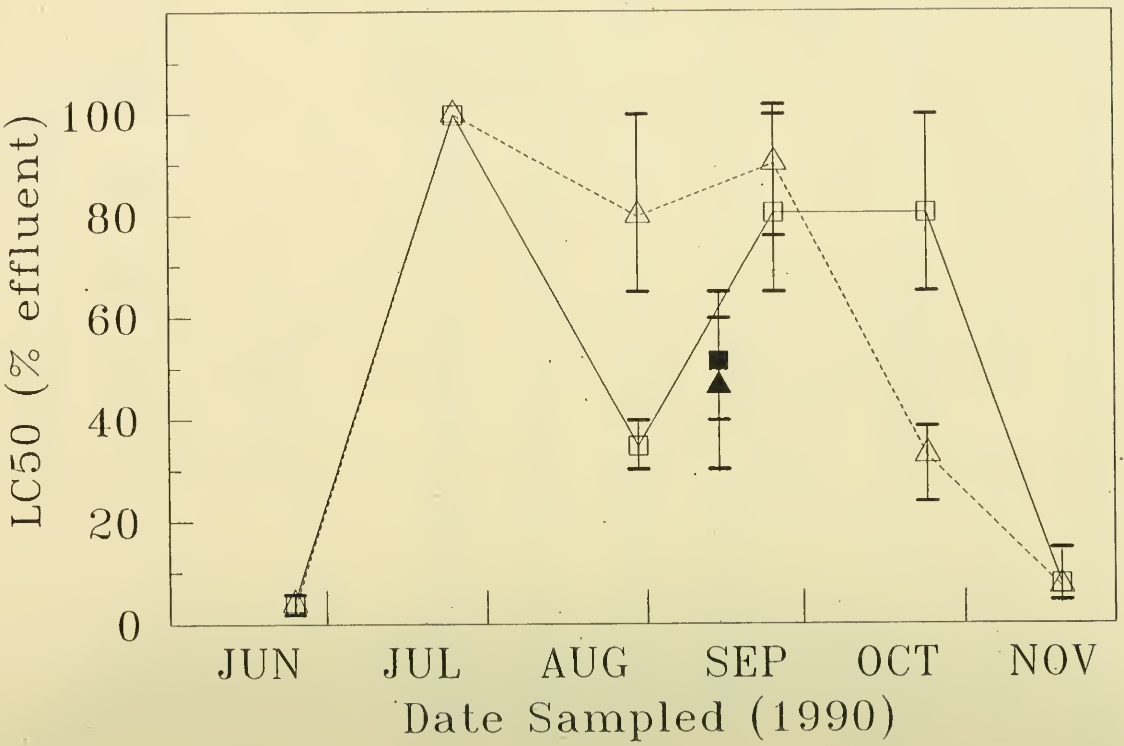


Figure 3.
Nanticoke TGS
Ash Lagoon (100)

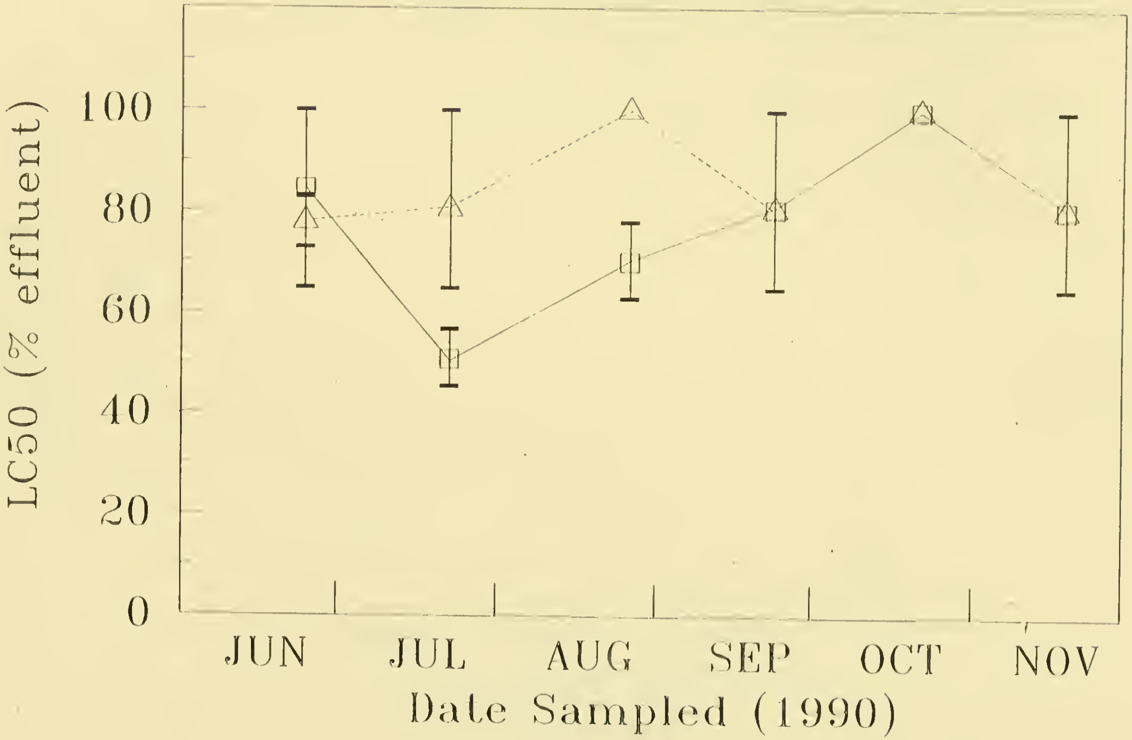


Figure 4.
Bruce NGS A
WTP Neutral Sump (2000)

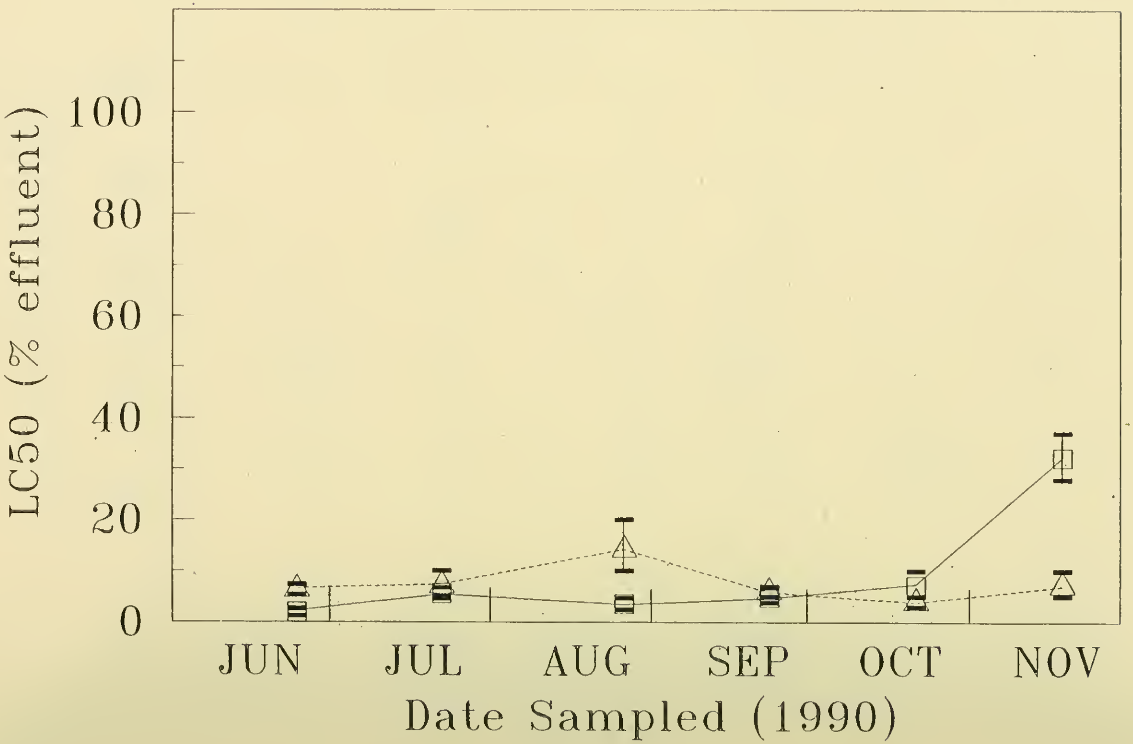


Figure 5.
Darlington NGS
WTP Neutral Sump (2200)

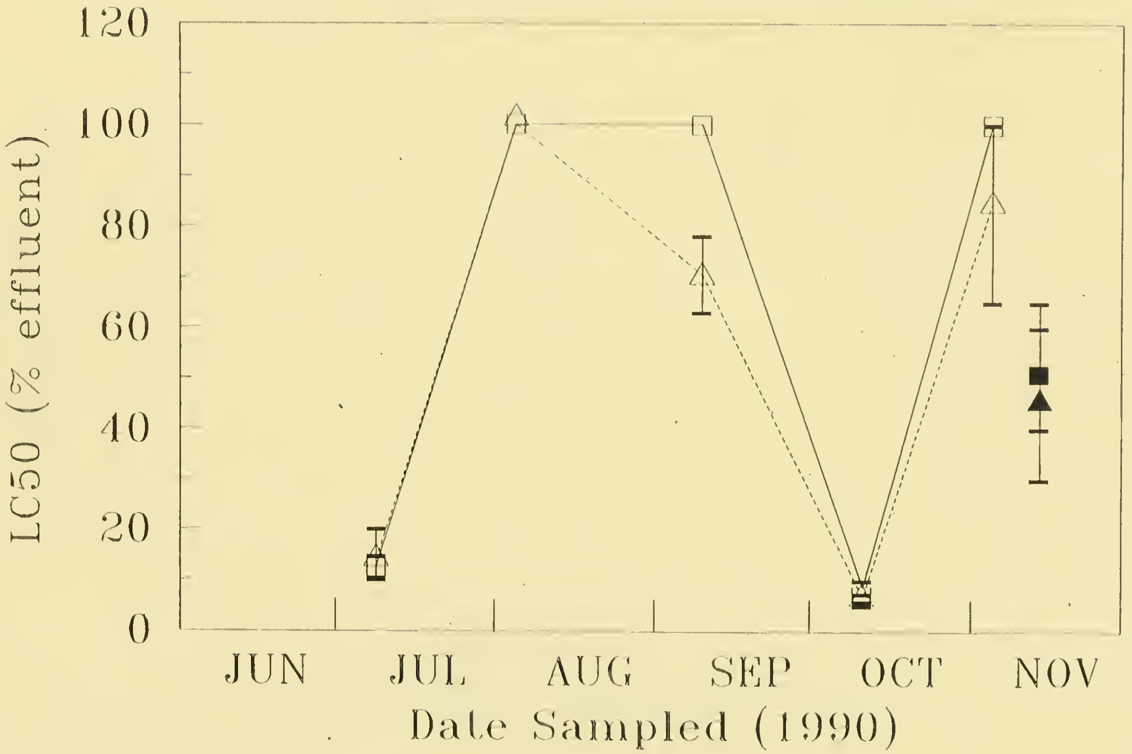


Figure 6.
Chalk River Nuclear Laboratories
Sanitary Sewer (500)

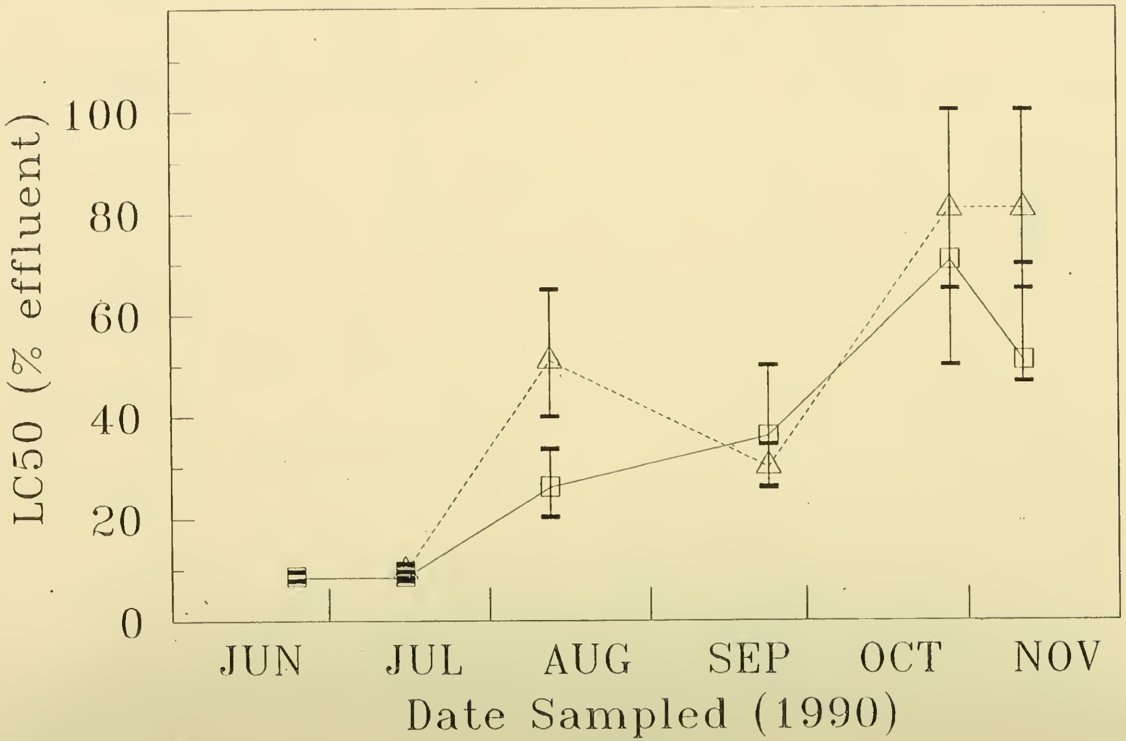


Figure 7.
Darlington Construction
TRF Boiler Blowdown (100)

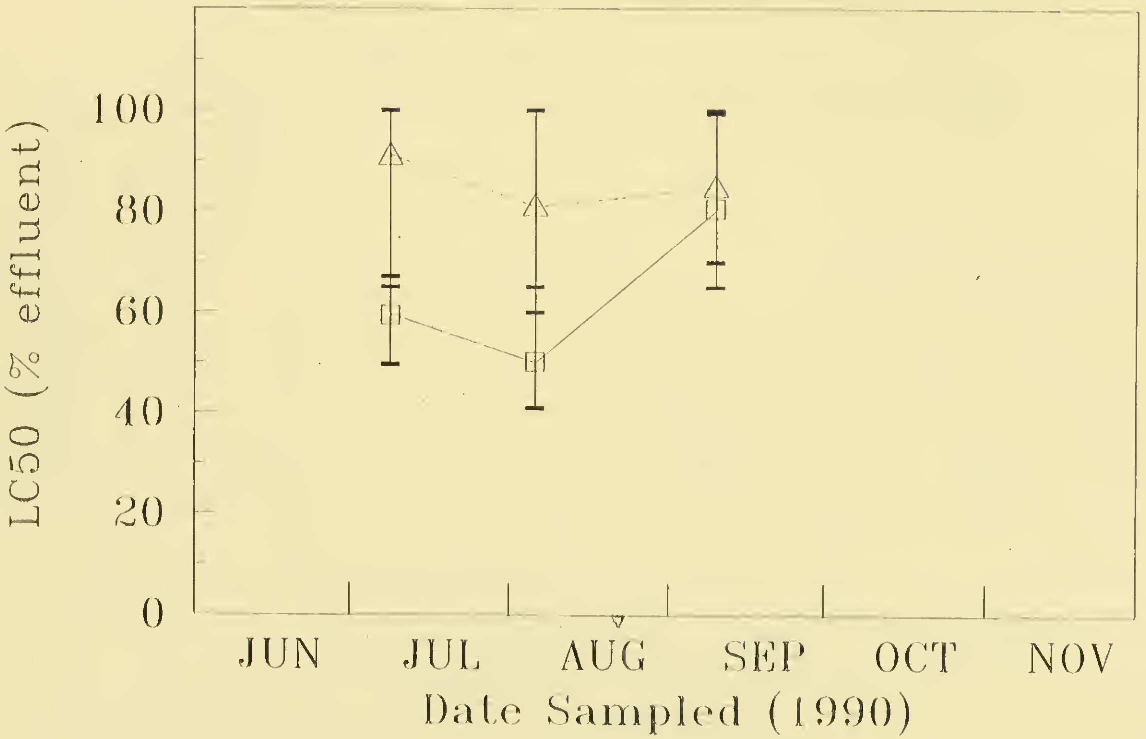


Figure 8.
Darlington Construction
Boiler Blowdown Effluent (200)

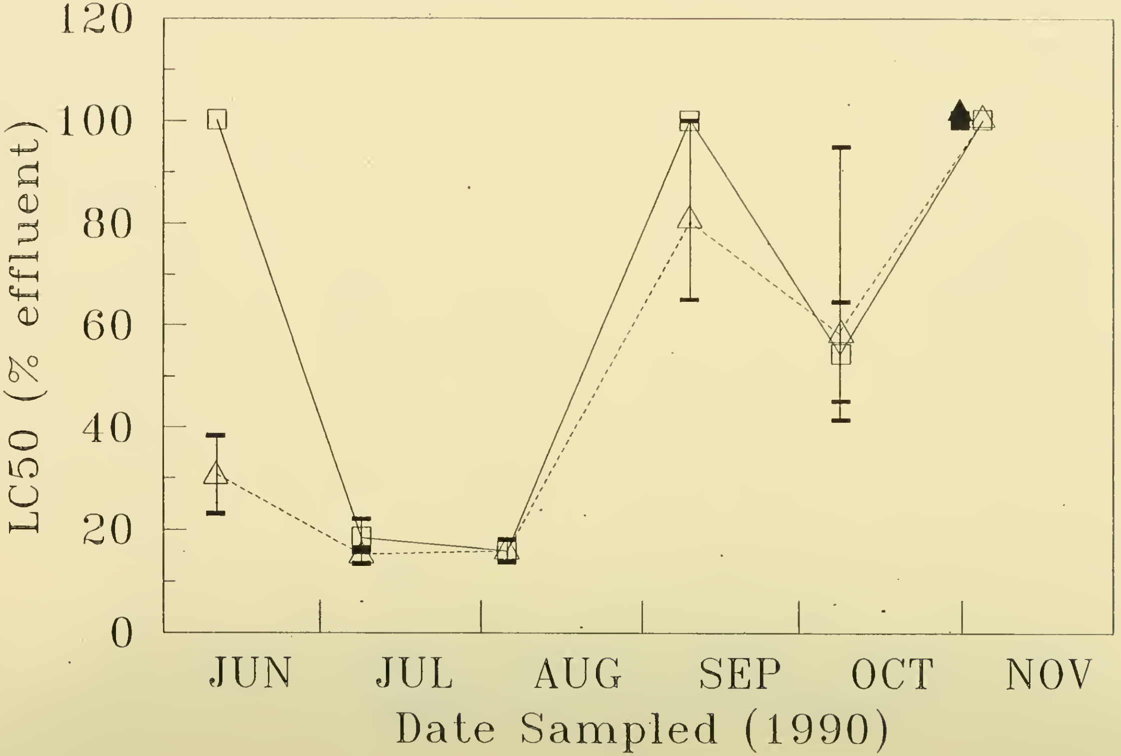
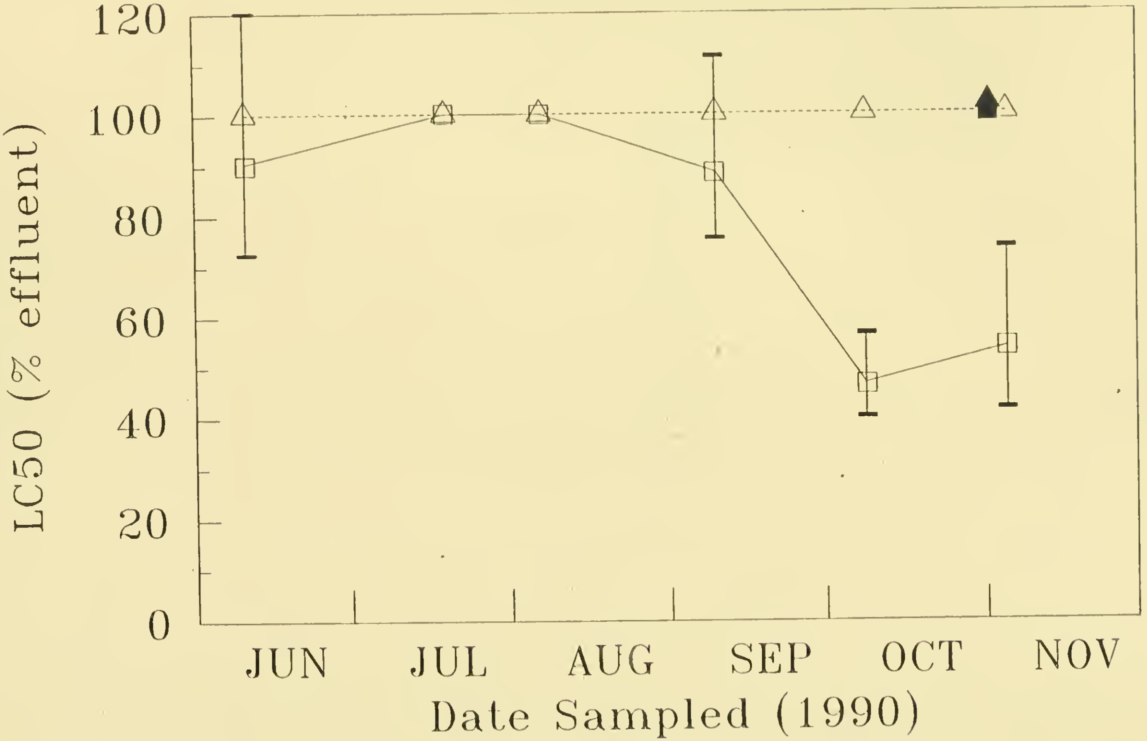


Figure 9.
Darlington Construction
WTP Neutral Sump (1100)



Data Summaries

Hydraulic

Generating Stations

COMPANY: Decew Falls, Welland
(49010200)
SECTOR: Electric Power Generation
REGION: West Central

SUMMARY

Rainbow trout acute lethality toxicity test data for two Intake Water samples and four Cooling Water Effluent samples collected between August and November 1990 were submitted by Decew Falls Generating Station of Welland.

All samples of Intake Water (700) and CW-2 (300) were non-lethal.

One sample from CW-1 (200) was not acutely lethal to trout and the other sample had a 96 h LC50 > 100%.

BE-Sump S1

CW-1

06901147 sampled: 08/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN THE 100% CONCENTRATION

06901864 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-2

06901149 sampled: 08/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901860 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-Switchyard

SW-Transformer

Decew Falls (continued)

Rain Gauge

Intake

```
06901145  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901862  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

COMPANY: Decew Falls, Welland
(49010200)
SECTOR: Electric Power Generation
REGION: West Central

SUMMARY

Daphnia magna acute lethality toxicity test data for two Intake Water samples and four cooling water effluent samples collected between August and November 1990 were submitted by Decew Falls of Welland.

All samples of Intake Water (700) and effluent from CW-1 (200), and CW-2 (300) were not acutely lethal to Daphnia.

BE-Sump S1

CW-1

```
06901148  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901865  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

CW-2

```
06901154  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901861  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

SW-Switchyard

SW-Transformer

Rain Gauge

Intake

```
06901146  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901863  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Decew Falls (continued)

COMPANY: Sir Adam Beck 2 GS, Queenston
(1842004)
SECTOR: Electric Power Generation
REGION: West Central

SUMMARY

Rainbow trout acute lethality toxicity test data for one Intake Water (1400) sample and two Cooling Water effluent samples (CW T15 (900) and CW T21 (1000)) collected in August 1990 were submitted by Sir Adam Beck 2 Generating Station of Queenston.

All three samples were non-lethal.

BE Sump S11

BE Sump S13

BE Sump S15

BE Sump 17

BE Sump S19

BE Sump S21

BE Sump S23

BE Sump S25

CW T15

06901153 sampled: 08/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW T21

06901155 sampled: 08/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW Switchyard

Sir Adam Beck 2 GS (continued)

SW Transformer

Rain Gauge

Intake

```
 06901151  sampled: 08/13/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT
```

COMPANY: Sir Adam Beck 2 GS, Queenston
(1842004)
SECTOR: Electric Power Generation
REGION: West Central

SUMMARY

Daphnia magna acute lethality toxicity test data for 2 Intake Water (1400) and four Cooling Water Effluent samples (CW T15 (900) and CW T21 (1000)) collected in August and November were submitted by Sir Adam Beck Generating Station of Queenston.

All samples were not acutely lethal to Daphnia.

BE Sump S11

BE Sump S13

BE Sump S15

BE Sump 17

BE Sump S19

BE Sump S21

BE Sump S23

BE Sump S25

CW T15

```
06901150  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901869  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

CW T21

```
06901156  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901871  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Sir Adam Beck 2 GS (continued)

SW Switchyard

SW Transformer

Rain Gauge

Intake

```
 06901152  sampled: 08/13/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901867  sampled: 11/12/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Thermal

Generating Stations

COMPANY: Atikokan - TGS, Atikokan
(1842301)
SECTOR: Electric Power Generation
REGION:

SUMMARY

Rainbow trout acute lethality toxicity test data for five Intake Water samples and 21 Effluent samples collected between June and November 1990 were submitted by Atikokan Thermal Generating Station of Atikokan.

The five Intake Water (1000) samples, one sample of CCW-Outfall (100) and five samples from the Oily Water Separator (600) were not acutely lethal to trout. One Ministry sample from the Oily Water Separator, collected in September, was also non-lethal.

Four of five sample from the Ash Transport System (200) were not acutely lethal to trout and one sample had a 96 h LC50 > 100%. A Ministry audit sample collected in September was also non-lethal.

Four of five samples from the WTP-Neut. Sump (800) were not acutely lethal to trout. The sample collected in June was toxic, with a 96 h LC50 = 77% effluent. A Ministry audit sample collected in September was non-lethal.

Six samples were collected from the Boiler Blowdown effluent (300). One sample was non-lethal, three had LC50s of >100 % effluent and two were toxic with LC50 values of 80.6, 88.4% effluent.

CCW-Outfall

04903489 sampled: 09/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Ash Transport System

04901933 sampled: 06/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04902621 sampled: 07/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

Atikokan - TGS (continued)

```
 04903490  sampled: 09/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 01900206  sampled: 09/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

 04904038  sampled: 09/24/90     LC50:  >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 04904617  sampled: 10/22/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

Boiler Blwdn

 04901776  sampled: 06/22/90     LC50:       80.6 %
   95% fid. limits:     0.0 -   0.0 %
   comments: Confidence limits are unreliable

 04902622  sampled: 07/23/90     LC50:  >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 04903488  sampled: 09/05/90     LC50:  >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 01900207  sampled: 09/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

 04904037  sampled: 09/24/90     LC50:  >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 04904619  sampled: 10/22/90     LC50:       88.4 %
   95% fid. limits:     0.0 -   0.0 %
   comments: Confidence limits are  unreliable

Coal Pile-Runoff

EO-Ash Tran System
```

Atikokan - TGS (continued)

```
Oily Water Separator

 04901934  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04902623  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04903492  sampled: 09/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 01900208  sampled: 09/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

 04904036  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04904618  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

SW-Yd Catch Basin

WTP-Neut.Sump

 04901935  sampled: 06/25/90     LC50:      77.0 %
   95% fid. limits:   70.6 -  84.0 %
   comments:

 04902624  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04903514  sampled: 09/07/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 01900209  sampled: 09/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

 04904040  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal
```

Atikokan - TGS (continued)

```
 04904620  sampled: 10/22/90    non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal
```

Rain Gauge

Intake Water

```
 04901936  sampled: 06/25/90    non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04902625  sampled: 07/23/90    non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04903491  sampled: 09/05/90    non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04904039  sampled: 09/24/90    non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04904621  sampled: 10/22/90    non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal
```

COMPANY: Atikokan - TGS, Atikokan
(1842301)
SECTOR: Electric Power Generation
REGION: Northwest

SUMMARY

Daphnia magna acute lethality toxicity test data for five Intake Water and 21 effluent samples collected between June and November 1990 were submitted by the Atikokan Thermal Generating Station of Atikokan.

The five Intake Water (1000) samples were not acutely lethal to Daphnia. The one sample of CCW-outfall (100) effluent was also not acutely lethal.

Four of five samples from the Oily Water Separator (600) were not acutely toxic to Daphnia, and one sample had an LC50 > 100%. A Ministry audit sample collected in September was also not acutely lethal.

Toxicity of samples from the Ash Transport System (200) was variable. Three of five samples were not acutely lethal, one sample had an LC50 > 100%, and one sample had a 48 h LC50 = 94%. Similarly, toxicity of effluent samples from the WTP Neutral Sump (800) was variable. One of five samples was not acutely lethal, three samples had 48 h LC50s > 100%, and one sample had an LC50 = 72.8%. Ministry audit samples collected in September for both outfalls were not acutely lethal to Daphnia.

Boiler Blowdown Effluents (300) were consistently toxic to Daphnia. 48 h LC50s ranged between 40.2 and 84.1%. Toxicity from most of these samples was consistent with osmotic stress.

CCW-Outfall

```
  04903489  sampled: 09/05/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments:
```

Atikokan - TGS (continued)

Ash Transport System

```
04901933  sampled: 06/25/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

04902621  sampled: 07/23/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments:

04903490  sampled: 09/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

02900206  sampled: 09/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

04904038  sampled: 09/24/90     LC50:      94.0 %
  95% fid. limits:    0.0 -   0.0 %
  comments:

04904617  sampled: 10/22/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:
```

Boiler Blwdn

```
04901776  sampled: 06/22/90     LC50:      80.6 %
  95% fid. limits:   73.0 -  88.9 %
  comments:

04902622  sampled: 07/23/90     LC50:      40.2 %
  95% fid. limits:   31.6 -  51.1 %
  comments:

04903488  sampled: 09/05/90     LC50:      85.1 %
  95% fid. limits:   76.3 -  94.7 %
  comments:

02900207  sampled: 09/19/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Very low conductivity

04904037  sampled: 09/24/90     LC50:      80.6 %
  95% fid. limits:    0.0 -   0.0 %
  comments:

04904619  sampled: 10/22/90     LC50:      72.9 %
  95% fid. limits:   64.0 -  83.0 %
  comments:
```

```
Coal Pile-Runoff

EO-Ash Tran System

Oily Water Separator

 04901934   sampled: 06/25/90     LC50:  >100   %
   95% fid. limits:     0.0 -    0.0 %
   comments: 2 dead @ 100%

 04902623   sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: non-lethal

 04903492   sampled: 09/05/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments:

 02900208   sampled: 09/19/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: MISA Audit; Non-lethal

 04904036   sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: non-lethal

 04904618   sampled: 10/22/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments:

SW-Yd Catch Basin

WTP-Neut.Sump

 04901935   sampled: 06/25/90     LC50:      72.8 %
   95% fid. limits:    54.2 -   97.6 %
   comments:

 04902624   sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: non-lethal

 04903514   sampled: 09/07/90     LC50:  >100   %
   95% fid. limits:     0.0 -    0.0 %
   comments:

 02900209   sampled: 09/19/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: MISA Audit; Non-lethal; High Conductivity
```

Atikokan - TGS (continued)

04904040 sampled: 09/24/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

04904620 sampled: 10/22/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: >100%

Rain Gauge

Intake Water

04901936 sampled: 06/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04902625 sampled: 07/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04903491 sampled: 09/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04904039 sampled: 09/24/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04904621 sampled: 10/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

COMPANY: Lakeview TGS, Mississauga
(1843101)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Rainbow trout acute lethality toxicity test data for six Intake Water samples and 32 Effluent samples collected between June and November 1990 were submitted by Lakeview Thermal Generating Station of Mississauga.

The six samples from the Cooling Water Intake (2900) were not acutely lethal to trout. Similarly two samples from CCW-Outfall (100), 5 samples from Coal Pile Treated (1800) and 5 samples from the Oily Water Pumphouse (2400) were non-lethal.

Five of six samples from the Ash Transport System (200) were not acutely lethal to trout and one sample had a 96 h LC50 > 100%. The Ministry audit sample collected in October was toxic to trout with an LC50 = 55% effluent.

Two of eight samples from the Boiler Blowdown Effluents, Units 3 (1100), 4 (1200), 7 (1500), and 8 (1600), were not acutely lethal to trout. The six remaining samples were toxic with LC50 values ranging from 70.2 to 90.6% effluent. Both Ministry audits, collected in October, had 96 h LC50s > 100%.

Five of six samples from the Oily Water Powerhouse (2300) were not acutely lethal to trout and one sample had an LC50 = 75.2% effluent. The Ministry audit sample collected in October had a 96 h LC50 > 100%.

A Ministry audit sample was collected from the WTP-Neut. Sump (2700). This sample was acutely lethal to trout with a 96 h LC50 = 14.1%.

CCW-Outfall

06900850 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901578 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lakeview TGS (continued)

```
Ash Transport System

 06900700  sampled: 06/11/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 30% MORTALITY IN THE 100% CONCENTRATION

 06900844  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901030  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901356  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900216  sampled: 10/02/90     LC50:       55.0 %
   95% fid. limits:   47.9 -  63.3 %
   comments: MISA Audit

 06901580  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901783  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-U3

BE-U4

BE-U5

BE-U6

BE-U 1,2

BE-U 7,8

Boiler Blwdn-U1

Boiler Blwdn-U2
```

Lakeview TGS (continued)

Boiler Blwdn-U3

```
 06901058  sampled: 08/07/90     LC50:      90.6 %
   95% fid. limits:   65.0 -  99.9 %
   comments: UPPER CONFIDENCE LIMIT CANNOT BE CALCULATED

 01900218  sampled: 10/02/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

 06901582  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Boiler Blwdn-U4

```
 06901358  sampled: 09/10/90     LC50:      80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 100% MORTALITY IN THE 100% CONCENTRATION

 06901785  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Boiler Blwdn-U5

Boiler Blwdn-U6

Boiler Blwdn-U7

```
 06901060  sampled: 08/07/90     LC50:      75.2 %
   95% fid. limits:   68.9 -  82.1 %
   comments: 20% MORTALITY IN THE 65% CONCENTRATION

 06901360  sampled: 09/10/90     LC50:      80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 100% MORTALITY IN THE 100% CONCENTRATION

 01900219  sampled: 10/02/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit
```

Boiler Blwdn-U8

```
 06900698  sampled: 06/11/90     LC50:      70.2 %
   95% fid. limits:   63.0 -  78.1 %
   comments: 40% MORTALITY IN THE 65% CONCENTRATION

 06900856  sampled: 07/09/90     LC50:      70.8 %
   95% fid. limits:   61.1 -  82.0 %
   comments: 90% MORTALITY IN THE 100% CONCENTRATION
```

Lakeview TGS (continued)

Raw Coal Pile Roff

Coal Pile Treated

```
 06900848  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901032  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901364  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900229  sampled: 10/12/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: MISA Audit; Non-lethal

 06901686  sampled: 10/17/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901858  sampled: 11/09/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

EC-Boiler Acid Cl.

Ec-Air Ph Washing

EO-Ash Filt. Pl-E

Eo-Coal Pile

Oily Water Pwrhse

```
 06900696  sampled: 06/11/90     LC50:       75.2 %
   95% fid. limits:   68.9 -  82.1 %
   comments: 20% MORTALITY IN THE 65% CONCENTRATION

 06900854  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901036  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Lakeview TGS (continued)

06901362 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900220 sampled: 10/02/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06901584 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901787 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Pumphouse

06900852 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901038 sampled: 08/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901366 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900221 sampled: 10/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non Lethal

06901586 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901789 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-S. Yd Drain

SW-N. Yd Drain

Lakeview TGS (continued)

WTP-Neut. Sump

01900217 sampled: 10/02/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: MISA Audit

Rain Gauge

Cooling Water Intake

06900694 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900846 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY AT 30% AND 100% CONCENTRATIONS

06901034 sampled: 08/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901354 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901576 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901781 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-U 5-8 PH Sump

Chlor Cool Wat-U1

Chlor Cool Wat-U2

Chlor Cool Wat-U3

Chlor Cool Wat-U4

Chlor Cool Wat-U5

Lakeview TGS (continued)

Chlor Cool Wat-U6

Chlor Cool Wat-U7

Chlor Cool Wat-U8

EO-Ash Filt Pl-W

COMPANY: Lakeview TGS, Mississauga (1843101)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Daphnia magna acute lethality toxicity test data for six Cooling Water Intake samples and 32 effluent samples collected between June and November 1990 were submitted by Lakeview Thermal Generating Station of Mississauga.

The six Cooling Water Intake samples (2900) were not acutely lethal to Daphnia. Similarly two samples of CCW-outfall (100) and five samples from Coal Pile Treated effluent (1800) were not acutely lethal.

Five of six samples from the Ash Transport System (200) were not acutely lethal to Daphnia and one sample had a 48 h LC50 > 100%. A Ministry audit sample collected in October was toxic to Daphnia with an LC50 between 60 and 100%.

Four of six samples from the Oily Water Powerhouse (2300) were not acutely lethal and two samples had 48 h LC50s between 23.5 and 86.6%. A Ministry audit sample collected in October had an LC50 > 100%, with an 48 h EC50 between 0 and 5% (measured effect was number of animals trapped in a surface film).

Four of five samples from the Oily Water Pumphouse (2400) were not acutely lethal to Daphnia, and one sample was toxic with a 48 h LC50 = 84.5%. A Ministry audit sample collected in October had an LC50 > 100%. This effluent sample caused many animals to be trapped in a surface film, similar to the October sample from the Oily Water Powerhouse.

All eight samples of Boiler Blowdown effluent from units U3 (1100), U4 (1200), U7 (1500), and U8 (1600) were acutely toxic to Daphnia. 48 h LC50s ranged between 19.0 and 65.5%. Conductivity values were very low in 100% effluent concentrations, but mortality data was inconsistent with osmotic stress. It appears there may be other factors contributing to the toxicity of these samples. A Ministry audit sample collected from Unit 3 in October had a 48 h LC50 between 60 and 100%. An audit sample from Unit 7 had an LC50 > 100%.

A Ministry audit sample collected from the Waste Treatment Plant Neutral Sump (2700) in October was toxic to Daphnia with a 48 h LC50 between 15 and 30% effluent.

Lakeview TGS (continued)

CCW-Outfall

```
06900851  sampled: 07/09/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901579  sampled: 10/09/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Ash Transport System

```
06900701  sampled: 06/11/90     LC50:  >100  %
  95% fid. limits:     0.0 -   0.0 %
  comments: 30% MORTALITY IN THE 100% CONCENTRATION

06900845  sampled: 07/09/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901031  sampled: 08/06/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901357  sampled: 09/10/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

02900216  sampled: 10/02/90     LC50:       60.0 - 100.0  %
  95% fid. limits:     0.0 -   0.0 %
  comments: MISA Audit

06901581  sampled: 10/09/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901784  sampled: 11/05/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

BE-U3

BE-U4

BE-U5

```
               Lakeview TGS (continued)

BE-U6

BE-U 1,2

BE-U 7,8

Boiler Blwdn-U1

Boiler Blwdn-U2

Boiler Blwdn-U3

 06901059  sampled: 08/07/90     LC50:       65.5 %
   95% fid. limits:   58.8 -  72.9 %
   comments: 60% MORTALITY IN THE 65% CONCENTRATION

 02900218  sampled: 10/02/90     LC50:       60.0 - 100.0  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit\Very low conductivity

 06901583  sampled: 10/09/90     LC50:       43.3 %
   95% fid. limits:   38.5 -  48.7 %
   comments: PARTIAL MORTALITY IN THE 50% AND 65% CONC.

Boiler Blwdn-U4

 06901359  sampled: 09/10/90     LC50:       47.0 %
   95% fid. limits:   41.5 -  53.0 %
   comments: 50 % MORTALITY IN THE 50% CONCENTRATION

 06901786  sampled: 11/05/90     LC50:       50.7 %
   95% fid. limits:   41.1 -  59.9 %
   comments: PARTIAL MORTALITY IN THE 50% AND 65% CONC.

Boiler Blwdn-U5

Boiler Blwdn-U6

Boiler Blwdn-U7

 06901061  sampled: 08/07/90     LC50:       52.8 %
   95% fid. limits:   47.8 -  58.1 %
   comments: 20% MORTALITY IN THE 50% CONCENTRATION

 06901361  sampled: 09/10/90     LC50:       19.0 %
   95% fid. limits:   14.0 -  24.0 % slope:     5.4
   comments: 80% MORTALITY IN THE 20% CONCENTRATION

 02900219  sampled: 10/02/90     LC50:  >100    %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit\Very low conductivity
```

```
             Lakeview TGS (continued)

Boiler Blwdn-U8

 06900699  sampled: 06/11/90     LC50:      25.7 %
   95% fid. limits:   20.0 -  31.6 % slope:     6.1
   comments: 20% MORTALITY IN THE 20% CONCENTRATION

 06900857  sampled: 07/09/90     LC50:      56.8 %
   95% fid. limits:   47.0 -  67.1 % slope:     8.7
   comments: 40% MORTALITY AT 50% CONCENTRATION

Raw Coal Pile Roff

Coal Pile Treated

 06900849  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901033  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901365  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 02900229  sampled: 10/12/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit\Many floaters

 06901685  sampled: 10/17/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901859  sampled: 11/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

EC-Boiler Acid Cl.

Ec-Air Ph Washing

EO-Ash Filt. Pl-E

Eo-Coal Pile
```

Lakeview TGS (continued)

Oily Water Pwrhse

```
06900697  sampled: 06/11/90     LC50:      86.6 %
  95% fid. limits:   74.8 - 100.2 %
  comments: 10% MORTALITY IN THE 65% CONCENTRATION

06900855  sampled: 07/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901037  sampled: 08/06/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901363  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

02900220  sampled: 10/02/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit\EC 50 = 0-5 (Floaters)

06901585  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901788  sampled: 11/05/90     LC50:      23.5 %
  95% fid. limits:   19.7 -  27.7 % slope:    12.1
  comments: PARTIAL MORTALITY IN THE 20% AND 30% CONC.
```

Oily Water Pumphouse

```
06900853  sampled: 07/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901039  sampled: 08/06/90     LC50:      84.5 %
  95% fid. limits:   72.7 - 111.7 % slope:     8.6
  comments: PARTIAL MORTALITY IN THE 65% AND 100% CONC.

06901367  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

02900221  sampled: 10/02/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit\EC 50 = 0-5 (Floaters)

06901587  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

```
               Lakeview TGS (continued)

 06901790  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

SW-S. Yd Drain

SW-N. Yd Drain

WTP-Neut. Sump

 02900217  sampled: 10/02/90     LC50:      15.0 -  30.0  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit\High pH & conductivity

Rain Gauge

Cooling Water Intake

 06900695  sampled: 06/11/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06900847  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901035  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901355  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901577  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901782  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

BE-U 5-8 PH Sump

Chlor Cool Wat-U1
```

Lakeview TGS (continued)

Chlor Cool Wat-U2

Chlor Cool Wat-U3

Chlor Cool Wat-U4

Chlor Cool Wat-U5

Chlor Cool Wat-U6

Chlor Cool Wat-U7

Chlor Cool Wat-U8

EO-Ash Filt Pl-W

COMPANY: Lambton TGS, Courtright
(1841204)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake water samples and 23 Effluent samples collected between June and November 1990 were submitted by Lambton Thermal Generating Station.

Five of six samples of Intake Water (100) were not acutely lethal to trout and one sample had a 96 h LC50 > 100%.

Two sample from each of CCW-Outfall (200), CW-N Yard (1300), and the Unit 2 Transformer (1800) were not non-lethal. Similarly, the six samples from each of the Ash Transport System (800) and C P-Lake Lambton (1100) were not acutely lethal to trout.

Three of five samples from the Boiler Blowdown Effluents Units 1 (400), 3 (600) and 4 (700) were toxic to trout. 96 h LC50 values were 72, 83.9 and 93.8% effluent. The two remaining samples had LC50s > 100%.

Intake Water

```
06900809  sampled: 06/25/90      LC50:  >100  %
  95% fid. limits:     0.0 -    0.0 %
  comments: 10% MORTALITY IN THE 100% CONCENTRATION

06900991  sampled: 07/23/90      non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901257  sampled: 08/27/90      non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901493  sampled: 09/24/90      non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901731  sampled: 10/22/90      non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901925  sampled: 11/19/90      non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Lambton TGS (continued)

```
CCW-Outfall

 06900989  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901737  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EO-Ash Filt Plant

Boiler Blwdn-U1

 06901735  sampled: 10/22/90     LC50:      93.8 %
   95% fid. limits:   91.9 -  95.8 %
   comments: 10% MORTALITY IN THE 90% CONCENTRATION

 06901929  sampled: 11/19/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Blwdn-U2

Boiler Blwdn-U3

 06900995  sampled: 07/23/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 30% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn-U4

 06900815  sampled: 06/25/90     LC50:      83.9 %
   95% fid. limits:   69.4 - 122.8 % slope:     6.4
   comments: MORTALITY OBSERVED IN 50, 65, AND 100%

 06901261  sampled: 08/27/90     LC50:      72.0 %
   95% fid. limits:   63.5 -  83.6 %
   comments: PARTIAL MORTALITY IN THE 50% AND 65% CONC.

Ash Transport System

 06900811  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901001  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

```
                 Lambton TGS (continued)

  06901259  sampled: 08/27/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901491  sampled: 09/24/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR IMMOBILITY OBSERVED

  06901733  sampled: 10/22/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901927  sampled: 11/19/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 BE-N Building Drain

 C P Effl B'man Pit

 C P-Lake Lambton

  06900813  sampled: 06/25/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06900993  sampled: 07/23/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901263  sampled: 08/27/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901489  sampled: 09/24/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901615  sampled: 10/09/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901931  sampled: 11/19/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Lambton TGS (continued)

```
PE-Neut Sump

CW-N Yd

 06900997  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901739  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Air Ph Wash

EC-Boiler Wsh/Clean

SW-N Yd

Rain Gauge

Unit 2 Transformer

 06900999  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901741  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-Admin Pumphouse

BE-U 1 & 2 Phouse

BE-U 3 & 4 Phouse

Coal Yd Maint GAr

Chlorination-U 1

Chlorination - U 2

Chlorination - U 3

Chlorination - U 4
```

Lambton TGS (continued)

COMPANY: Lambton TGS, Courtright
(1841204)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Daphnia magna acute lethality toxicity test data for six Intake Water samples and 23 effluent samples from 8 sites collected between June and November 1990 were submitted by Lambton Thermal Generating Station of Courtright.

Six samples of Intake Water (100) were not acutely lethal to Daphnia magna, as were two samples from each of the CCW-outfall (200), CW-N yard (1300) and the Unit 2 Transformer (1800), and six samples from each of the Ash Transport System (800) and C P-Lake Lambton (1100).

All samples from Boiler Blowdowns U1 (400), U3 (600), and U4 (700) were acutely lethal to Daphnia. LC50s ranged from 39.2 to 70.2%. Conductivity levels were low in the 100% effluent samples, but the toxicity responses were not consistent with osmotic stress acting alone. It appears some other factor may be contributing to the toxicity of these samples.

Intake Water

```
 06900810  sampled: 06/25/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06900992  sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OBSERVED DURING TEST PERIOD

 06901258  sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901495  sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901732  sampled: 10/22/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06901926  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Lambton TGS (continued)

```
CCW-Outfall

 06900990  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901738  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

EO-Ash Filt Plant

Boiler Blwdn-U1

 06901736  sampled: 10/22/90     LC50:         59.0 %
   95% fid. limits:   55.3 -  63.0 %
   comments: 90% MORTALITY IN 65% TEST CONCENTRATION.

 06901930  sampled: 11/19/90     LC50:         39.2 %
   95% fid. limits:   30.2 -  49.0 % slope:     4.7
   comments: PARTIAL MORTALITY IN 30%, 50%, AND 65% CONC.

Boiler Blwdn-U2

Boiler Blwdn-U3

 06900996  sampled: 07/23/90     LC50:         70.2 %
   95% fid. limits:   63.0 -  78.1 %
   comments: 40% MORTALITY IN THE 65% CONCENTRATION

Boiler Blwdn-U4

 06900816  sampled: 06/25/90     LC50:         41.8 %
   95% fid. limits:   37.9 -  46.1 %
   comments: 80% MORTALITY IN THE 50% CONCENTRATION

 06901262  sampled: 08/27/90     LC50:         46.9 %
   95% fid. limits:   37.3 -  53.7 % slope:    11.0
   comments: PARTIAL MORTALITY IN THE 50% AND 65% CONC.

Ash Transport System

 06900812  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901002  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

```
             Lambton TGS (continued)

 06901260  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901492  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901734  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901928  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

BE-N Building Drain

C P Effl B'man Pit

C P-Lake Lambton

 06900814  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06900994  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901264  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901490  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901616  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901932  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Lambton TGS (continued)

PE-Neut Sump

CW-N Yd

```
 06900998  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901740  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS
```

EC-Air Ph Wash

EC-Boiler Wsh/Clean

SW-N Yd

Rain Gauge

Unit 2 Transformer

```
 06901000  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901742  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS
```

BE-Admin Pumphouse

BE-U 1 & 2 Phouse

BE-U 3 & 4 Phouse

Coal Yd Maint GAr

Chlorination-U 1

Chlorination - U 2

Chlorination - U 3

Chlorination - U 4

Lambton TGS (continued)

COMPANY: Lennox TGS, South Fredericksberg
(1843309)
SECTOR: Electric Power Generation
REGION: Southeast

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake Water samples and 24 Effluent samples collected between June and November 1990 were submitted by Lennox Thermal Generating Station of South Fredericksberg.

One of six Intake Water (2000) samples had a 96 h LC50 > 100%. The remaining samples were non-lethal. Similarly, one of six samples from the PE-WTP Neut. S SP (2300) and PE-Oily Water TP Dis (300) had an LC50 > 100% and the others were non-lethal. One of two samples from the CW-CCW Outfall (200) had an LC50 > 100%, and the other sample was non-lethal. The four lethal samples from these outfalls were collected on the same date in July. Ministry audit samples for PE-WTP Neut. S Sp and PE-Oily Wat TP Dis were non-lethal.

Two samples collected from each of the CW-U 1,2 Trans Cool (1500) and CW-U 3,4 Trans Cool (1600) and tested for acute toxicity to rainbow trout were non-lethal.

Three of six samples from Boiler Blowdown Units 1 (1100), 2 (1200), 3 (1300) and 4 (1400) had 96 h LC50s > 100% effluent. The remaining 3 samples were acutely lethal, with LC50s of 45.1, 67.8 and 76.7% effluent. A Ministry audit sample collected in November had an LC50 > 100%.

CW-CCW Outfall

06900874 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: PARTIAL MORTALITY IN 30, 50, 65, AND 100%

06901599 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

PE-Oily Wat TP Dis

06900704 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900866 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTASLITY IN THE 100% CONCENTRATION

Lennox TGS (continued)

```
 06901052  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901382  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901638  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901797  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900268  sampled: 11/20/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

BE-Pumphouse Sump

BE-U1 Sump

BE-U2 Sump

BE-U3 Sump

BE-U4 Sump

Boiler Blwdn-U1

 06901433  sampled: 09/17/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 20% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn-U2

 06900706  sampled: 06/11/90     LC50:      67.8 %
   95% fid. limits:   60.7 -  75.6 %
   comments: 50% MORTALITY IN THE 65% CONCENTRATION

Boiler Blwdn-U3

 06900878  sampled: 07/09/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 20% MORTALITY IN THE 100% CONCENTRATION

 06901603  sampled: 10/09/90     LC50:      76.7 %
   95% fid. limits:   70.0 -  84.0 %
   comments: 14% MORTALITY IN THE 65% CONCENTRATION
```

```
               Lennox TGS (continued)

Boiler Blwdn-U4

 06901266  sampled: 08/27/90     LC50:      45.1 %
   95% fid. limits:    36.8 -  53.0 % slope:     8.8
   comments: PARTIAL MORTALITY IN THE 30% AND 50% CONC.

 06901795  sampled: 11/05/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 20% MORTALITY IN THE 100% CONCENTRATION

 01900267  sampled: 11/20/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit

CW-U 1,2 Trans Cool

 06900870  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901634  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-U 3,4 Trans Cool

 06900868  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901601  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Air Ph Wash Lag

EC-Boiler Wsh/Clean

Rain Gauge

Intake Water

 06900708  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900872  sampled: 07/09/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 10% MORTALITY IN THE 100% CONCENTRATION
```

```
            Lennox TGS (continued)

 06901056  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901384  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901597  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901791  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-W Yd Drainage

SW-E Yd Drainage

PE-WTP Neut. S SP

 06900702  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900876  sampled: 07/09/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 20% MORTALITY IN THE 100% CONCENTRATION

 06901054  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901386  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901636  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901793  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900266  sampled: 11/20/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit
```

Lennox TGS (continued)

COMPANY: Lennox TGS, South Fredericksberg
(1843309)
SECTOR: Electric Power Generation
REGION: Southeast

SUMMARY

Data for thirty acute lethality toxicity tests conducted on samples collected between June and November 1990, from 9 effluent sites and 1 intake site were submitted by Lennox TGS of South Fredericksberg.

Two samples from each of CW-CCW Outfall (200), CW-U 1,2 Trans Cool (1500), and CW-U 3,4 Trans Cool (1600) were not acutely lethal to Daphnia. There were no mortalities in six tests conducted on samples of Intake Water (2000) submitted by the company.

Five of six samples of PE-oily Water TP Discharge (300) were not acutely lethal, and one sample had four animals die in the pure effluent over the duration of the test. A Ministry audit of this outfall generated a 48 h LC50 > 100%. Similarly five of six samples from the PE-WTP Neutral Sump SP (2300) were not acutely lethal to Daphnia and one sample collected in July had a 48 H LC50 > 100%. A Ministry audit sample from this site was not acutely lethal to Daphnia.

Six effluent samples from Boiler Blowdown U1 (1100), U2 (1200), U3 (1300), and U4 (1400) were all acutely lethal to Daphnia. Conductivity measurements for these samples were very low in the 100% effluent concentrations, and some of the toxicity could be due to osmotic stress (eg. BB-U1), but this does not explain the toxicity at lower effluent concentrations (eg. BB-U4 48 h LC50 = 8.8%). A Ministry audit sample from unit U4 was also acutely lethal to Daphnia.

CW-CCW Outfall

```
06900875  sampled: 07/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901600  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Lennox TGS (continued)

```
PE-Oily Wat TP Dis

 06900705  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MOTTALITY OR IMMOBILITY OBSERVED

 06900867  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBDERVED

 06901053  sampled: 08/06/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 40% MORTALITY IN THE 100% CONCENTRATION

 06901383  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901639  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901798  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 02900268  sampled: 11/20/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit

BE-Pumphouse Sump

BE-U1 Sump

BE-U2 Sump

BE-U3 Sump

BE-U4 Sump

Boiler Blwdn-U1

 06901434  sampled: 09/17/90     LC50:       80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 100% MORTALITY ON THE 100% CONCENTRATION
```

```
             Lennox TGS (continued)

Boiler Blwdn-U2

 06900707  sampled: 06/11/90     LC50:      27.1 %
   95% fid. limits:   21.5 -  33.1 % slope:     6.8
   comments: 10% MORTALITY IN THE 20% CONCENTRATION

Boiler Blwdn-U3

 06900879  sampled: 07/09/90     LC50:      57.0 %
   95% fid. limits:   50.0 -  65.0 %
   comments: 100% MORTALITY IN THE 65% CONCENTRATIONS

 06901604  sampled: 10/09/90     LC50:      33.8 %
   95% fid. limits:   29.6 -  38.5 %
   comments: 30% MORTALITY IN THE 30% CONCENTRATION

Boiler Blwdn-U4

 06901267  sampled: 08/27/90     LC50:       8.8 %
   95% fid. limits:    6.8 -  11.9 %
   comments: 40% MORTALITY IN THE 5% CONCENTRATION

 06901796  sampled: 11/05/90     LC50:      47.8 %
   95% fid. limits:   39.1 -  59.0 %
   comments: NO MORTALITY OR IMOBILITY OBSERVED

 02900267  sampled: 11/20/90     LC50:      60.0 - 100.0  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

CW-U 1,2 Trans Cool

 06900871  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901635  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CW-U 3,4 Trans Cool

 06900869  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901602  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Lennox TGS (continued)

```
EC-Air Ph Wash Lag

EC-Boiler Wsh/Clean

Rain Gauge

Intake Water

 06900709  sampled: 06/11/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OBSERVED DURING TEST PERIOD

 06900873  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901057  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901385  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBLITY OBSERVED

 06901598  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901792  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

SW-W Yd Drainage

SW-E Yd Drainage

PE-WTP Neut. S SP

 06900703  sampled: 06/11/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OBSERVED DURING TEST PERIOD

 06900877  sampled: 07/09/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: 20% MORTALITY IN THE 100% CONCENTRATION

 06901055  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Lennox TGS (continued)

```
06901387  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901637  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901794  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

02900266  sampled: 11/20/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; High conductivity
```

COMPANY: Nanticoke TGS, Nanticoke
(1840008)
SECTOR: Electric Power Generation
REGION: West Central

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake Water samples and 17 Effluent samples collected between June and Novemeber 1990 were submitted by Nanticoke Thermal Generating Station of Nanticoke.

Four of six Intake Water () samples were not acutely lethal to trout, and two samples had LC50s > 100% effluent.

Two samples from CCW-Outfall (200) were non-lethal.

One sample collected from the Ash Transport Line (300) had an LC50 > 100%. Two of six samples from the Ash Lagoon (100) had LC50s > 100%. The remaining 4 samples were acutely lethal, with 96 h LC50s between 77.9 and 80.6% effluent.

One sample from Boiler Blowdown Unit 7 (1800) was non-lethal and one sample from BB Unit 3 (1400) had an LC50 > 100%. The remaining six samples from Boiler Blowdown Units 1 (1200), 2 (1300), 4 (1500), and 6 (1700) were acutely toxic to trout with 96 h LC50s between 77.9 and 80.6% effluent.

Ash lagoon

```
06900787  sampled: 06/25/90     LC50:       77.9 %
  95% fid. limits:    72.9 -  83.1 %
  comments: 10% MORTALITY IN 65% TEST CONCENTRATION.

06900977  sampled: 07/23/90     LC50:       80.6 %
  95% fid. limits:    65.0 - 100.0 %
  comments: 100% MORTALITY IN THE 100% CONCENTRATION

06901249  sampled: 08/27/90     LC50:  >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments: PARTIAL MORTALITY IN THE 65% AND 100% CONC.

06901469  sampled: 09/24/90     LC50:       80.6 %
  95% fid. limits:    65.0 - 100.0 %
  comments: 100% MORTALITY IN THE 100% CONCENTRATION

06901727  sampled: 10/22/90     LC50:  >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments: 10% MORTALITY IN 65 & 100% CONCENTRATIONS
```

```
               Nanticoke TGS (continued)

  06901915  sampled: 11/19/90     LC50:       80.6 %
    95% fid. limits:   65.0 - 100.0 %
    comments: 100% MORTALITY IN THE 100% CONCENTRATION

CCW - Outfall

  06900973  sampled: 07/23/90     non-lethal
    95% fid. limits:     0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

  06901725  sampled: 10/22/90     non-lethal
    95% fid. limits:     0.0 -   0.0 %
    comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Ash Transport Line

  06901917  sampled: 11/19/90     LC50:  >100   %
    95% fid. limits:     0.0 -   0.0 %
    comments: 10% MORTALITY IN THE 100% CONCENTRATION

BE Unit 1 MH # 15

BE Unit 2 MH #14

BE Unit 3 MH #13

BE Unit 4 MH # 12

BE Unit 5, Sump 5

BE Unit 6 Sump 6

BE Unit 7, Sump 7

BE Unit 8 Sump 8

BE Pumphouse Unit 1,2

BE Pumphouse Unit 3,4

BE Pumphouse Unit 5,6

BE Pumphouse Unit 7,8

Boiler Blwdn Unit 1

  06900789  sampled: 06/25/90     LC50:       77.9 %
    95% fid. limits:   72.9 -  83.1 %
    comments: 10% MORTALITY IN THE 65% CONCENTRATION
```

Nanticoke TGS (continued)

06900975 sampled: 07/23/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn Unit 2

06901919 sampled: 11/19/90 LC50: 77.9 %
95% fid. limits: 72.9 - 83.1 %
comments: 10% MORTALITY IN THE 65% CONCENTRATION

Boiler Blwdn Unit 3

06901253 sampled: 08/27/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: PARTIAL MORTALITY IN THE 65% AND 100% CONC.

Boiler Blwdn Unit 4

06901255 sampled: 08/27/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn Unit 5

06901465 sampled: 09/24/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn Unit 6

06901467 sampled: 09/24/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn Unit 7

06901729 sampled: 10/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Blwdn Unit 8

Coal Pile Runoff NE Sump

Coal Pile Runoff NW Sump

Nanticoke TGS (continued)

EC Boiler Acid Wash Unit1

EC Boiler Acid Wash Unit2

EC Boiler Acid Wash Unit3

EC Boiler Acid Wash Unit4

EC Boiler Acid Wash Unit5

EC Boiler Acid Wash Unit6

EC Boiler Acid Wash Unit7

EC Boiler Acid Wash Unit8

EC Ext Boiler Wash Unit 1

EC Ext Boiler Wash Unit 2

EC Ext Boiler Wash Unit 3

EC Ext Boiler Wash Unit 4

EC Ext Boiler Wash Unit 5

EC Ext Boiler Wash Unit 6

EC Ext Boiler Wash Unit 7

EC Ext Boiler Wash Unit 8

EC Preheater Wash Unit 12

EC Preheater Wash Unit 34

EC Preheater Wash Unit 56

EC Preheater Wash Unit 78

Emergency Overflow

EO Hydrovac Unit 12

EO Hydrovac Unit 34

Nanticoke TGS (continued)

EO Hydrovac Unit 56

EO Hydrovac Unit 78

EO Ash Lagoon

EO Dust Supression Pumphs

SW-East

SW-South

SW-West

SW Truck Wash Station

WTP-Neut. Sump

Rain Gauge

Intake Water

```
 06900785  sampled: 06/25/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 10% MORTALITY IN THE 65% CONCENTRATION

 06900979  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901251  sampled: 08/27/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 10% MORTALITY IN THE 100% CONCENTRATION

 06901471  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901723  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901913  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Nanticoke TGS (continued)

TRO-Unit 1

TRO-Unit 2

TRO-Unit 3

TRO-Unit 4

TRO-Unit 5

TRO-Unit 6

TRO-Unit 7

TRO-Unit 8

COMPANY: Nanticoke TGS, Nanticoke
(1840008)
SECTOR: Electric Power Generation
REGION: West Central

SUMMARY

Daphnia magna acute lethality toxicity test data for 6 Intake Water samples and 17 effluent samples collected between June and November 1990 were submitted by Nanticoke Thermal Generating Station of Nanticoke.

All Intake Water samples were not acutely lethal to Daphnia. Effluent samples from the ash transport line (300), and the CCW-outfall (200) were also not acutely lethal.

Five of six samples from the Ash Lagoon (100) were acutely lethal to Daphnia with 48 h LC50s ranging from 50.8 to 84.4%. One sample had a 48 h LC50 > 100%.

Eight samples collected from Boiler Blowdown Units 1 (1200), U2 (1300), U3 (1400), U4 (1500), U5 (1600), U6 (1700) and U7 (1800) were acutely toxic to Daphnia with 48 h LC50s between 29.4 and 63.7%. Conductivity values were low in the pure effluent samples, but toxicity responses were not consistent with osmotic stress.

Ash lagoon

06900788 sampled: 06/25/90 LC50: 84.4 %
95% fid. limits: 65.0 - 100.0 %
comments: 90% MORTALITY IN 100% TEST CONCENTRATION.

06900978 sampled: 07/23/90 LC50: 50.8 %
95% fid. limits: 45.4 - 56.8 %
comments: 30% MORTALITY IN THE 50% CONCENTRATION

06901250 sampled: 08/27/90 LC50: 70.2 %
95% fid. limits: 63.0 - 78.1 %
comments: 40% MORTALITY IN THE 65% CONCENTRATION

06901470 sampled: 09/24/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901728 sampled: 10/22/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 30% MORTALITY IN 100% CONCENTRATION.

06901916 sampled: 11/19/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

Nanticoke TGS (continued)

```
CCW - Outfall

 06900974  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901726  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Ash Transport Line

 06901918  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

BE Unit 1 MH # 15

BE Unit 2 MH #14

BE Unit 3 MH #13

BE Unit 4 MH # 12

BE Unit 5, Sump 5

BE Unit 6 Sump 6

BE Unit 7, Sump 7

BE Unit 8 Sump 8

BE Pumphouse Unit 1,2

BE Pumphouse Unit 3,4

BE Pumphouse Unit 5,6

BE Pumphouse Unit 7,8

Boiler Blwdn Unit 1

 06900790  sampled: 06/25/90     LC50:       32.4 %
   95% fid. limits:   24.2 -  41.6 % slope:      3.9
   comments: 30% MORTALITY IN THE 20% CONCENTRATION

 06900976  sampled: 07/23/90     LC50:       30.8 %
   95% fid. limits:   26.6 -  35.6 %
   comments: 50% MORTALITY IN THE 30% CONCENTRATION
```

```
             Nanticoke TGS (continued)

Boiler Blwdn Unit 2

 06901920  sampled: 11/19/90     LC50:       34.3 %
   95% fid. limits:   44.1 -  26.3 % slope:     4.5
   comments: PARTIAL MORTALITY IN 20%, 30%, AND 50% CONC.

Boiler Blwdn Unit 3

 06901254  sampled: 08/27/90     LC50:       61.1 %
   95% fid. limits:   56.0 -  66.7 %
   comments: 80% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn Unit 4

 06901256  sampled: 08/27/90     LC50:       34.3 %
   95% fid. limits:   27.3 -  41.2 %
   comments: PARTIAL MORTALITY IN THE 30, 50, AND 65% CONC

Boiler Blwdn Unit 5

 06901466  sampled: 09/24/90     LC50:       57.0 %
   95% fid. limits:   50.0 -  65.0 %
   comments: 100% MORTALITY IN THE 65% CONCENTRATION

Boiler Blwdn Unit 6

 06901468  sampled: 09/24/90     LC50:       29.4 %
   95% fid. limits:   25.5 -  33.9 %
   comments: 60% MORTALITY IN THE 30% CONCENTRATION

Boiler Blwdn Unit 7

 06901730  sampled: 10/22/90     LC50:       63.7 %
   95% fid. limits:   53.7 -  78.3 %
   comments: 60% MORTALITY IN 65% TEST CONCENTRATION.

Boiler Blwdn Unit 8

Coal Pile Runoff NE Sump

Coal Pile Runoff NW Sump

EC Boiler Acid Wash Unit1

EC Boiler Acid Wash Unit2
```

Nanticoke TGS (continued)

EC Boiler Acid Wash Unit3

EC Boiler Acid Wash Unit4

EC Boiler Acid Wash Unit5

EC Boiler Acid Wash Unit6

EC Boiler Acid Wash Unit7

EC Boiler Acid Wash Unit8

EC Ext Boiler Wash Unit 1

EC Ext Boiler Wash Unit 2

EC Ext Boiler Wash Unit 3

EC Ext Boiler Wash Unit 4

EC Ext Boiler Wash Unit 5

EC Ext Boiler Wash Unit 6

EC Ext Boiler Wash Unit 7

EC Ext Boiler Wash Unit 8

EC Preheater Wash Unit 12

EC Preheater Wash Unit 34

EC Preheater Wash Unit 56

EC Preheater Wash Unit 78

Emergency Overflow

EO Hydrovac Unit 12

EO Hydrovac Unit 34

EO Hydrovac Unit 56

EO Hydrovac Unit 78

Nanticoke TGS (continued)

EO Ash Lagoon

EO Dust Supression Pumphs

SW-East

SW-South

SW-West

SW Truck Wash Station

WTP-Neut. Sump

Rain Gauge

Intake Water

```
 06900786  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900980  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OBSERVED DURING TEST PERIOD

 06901252  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901472  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901724  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06901914  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

TRO-Unit 1

TRO-Unit 2

Nanticoke TGS (continued)

TRO-Unit 3

TRO-Unit 4

TRO-Unit 5

TRO-Unit 6

TRO-Unit 7

TRO-Unit 8

COMPANY: R.L.Hearn TGS (Mothballed), Toronto
(1840602)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY
Rainbow trout acute lethality toxicity test data from two Intake Water (600) and two Cooling Water Outfall (300) samples collected in July and October 1990 were submitted by R.L. Hearn Thermal Generating Station of Toronto.

All four samples were not acutely lethal to trout.

SW-Sumphouse 1

BE-Sumphouse 3

CW-Outfall

06900860 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901574 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

INTAKE

06900858 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901572 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

COMPANY: R.L.Hearn TGS (Mothballed), Toronto (1840602)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

The R.L. Hearn Thermal Generating Station in Toronto has been mothballed, but this company still submitted Daphnia magna acute lethality toxicity data for two intake water (600) samples and two CW-outfall effluent (300) samples. These four samples were not acutely lethal to Daphnia.

SW-Sumphouse 1

BE-Sumphouse 3

CW-Outfall

```
 06900861  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901575  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Rain Gauge

INTAKE

```
 06900859  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901571  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTLITY OR IMMOBILITY OBSERVED
```

COMPANY: Thunder Bay GS, Thunder Bay (1841907)
SECTOR: Electric Power Generation
REGION: Northwest

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake Water and 26 Effluent samples collected between June and November 1990 were submitted by Thunder Bay Generating Station of Thunder Bay.

Six Intake Water (1700) samples were collected and all were not acutely lethal to trout, as were the two sample collected from the CCW Outfall (100).

All six samples collected from each of the Ash Transport System (200) and the Oily Water Separator (1100) were not acutely lethal to trout. Ministry audit samples collected from these sites in September had 96 h LC50s > 100%.

Two of four samples collected from Boiler Blowdown Unit 2 (1200) had LC50s > 100%, and the other two were acutely lethal with LC50s of 88.4 and 93.1% effluent. One of two samples collected from Unit 3 (1300) was non-lethal and the other had a 96 h LC50 of 80.6%.

Five of six samples from the WTP Neutral Sump (1500) were lethal to trout with 96 h LC50s ranging between 1.4 and 80.6% effluent. One sample was non-lethal. A ministry audit sample collected in September had an LC50 = 51% effluent.

CCW Outfall

```
04903241  sampled: 08/27/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

04905071  sampled: 11/19/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: non-lethal
```

Ash Transport System

```
04901868  sampled: 06/25/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: non-lethal

04902559  sampled: 07/23/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: non-lethal
```

```
                 Thunder Bay GS (continued)

   04903242  sampled: 08/27/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments:

   01900197  sampled: 09/12/90     LC50:  >100   %
     95% fid. limits:     0.0 -   0.0 %
     comments: MISA Audit

   04903866  sampled: 09/24/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments:

   04904487  sampled: 10/22/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments:

   04905072  sampled: 11/19/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: non-lethal

  Boiler Blowdown Unit 2

   04901869  sampled: 06/25/90     LC50:  >100   %
     95% fid. limits:     0.0 -   0.0 %
     comments:

   01900198  sampled: 09/12/90     LC50:  >100   %
     95% fid. limits:     0.0 -   0.0 %
     comments: MISA Audit

   04903868  sampled: 09/24/90     LC50:      88.4 %
     95% fid. limits:     0.0 -   0.0 %
     comments: Confidence limits are unreliable

   04904488  sampled: 10/22/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments:

   04905073  sampled: 11/19/90     LC50:      93.1 %
     95% fid. limits:     0.0 -   0.0 %
     comments: Confidence limits are unreliable

  Boiler Blwdn-Unit 3

   04902560  sampled: 07/23/90     LC50:      80.6 %
     95% fid. limits:     0.0 -   0.0 %
     comments: confidence limits unreliable

   04903243  sampled: 08/27/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments:
             Thunder Bay GS (continued)

Coal Pile Runoff

EC Boiler Wash/Clean

EC Air Preheater Wash

EO Surge Tank Overflow

Oily Water Seperator

 04901870  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04902561  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04903244  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 01900200  sampled: 09/12/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

 04903865  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04904489  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04905074  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-leathal

SW Combustion Turbine

SW Roadway Drains

WTP Neut. Sump

 04901871  sampled: 06/25/90     LC50:        1.4 %
   95% fid. limits:    0.0 -   0.0 %
   comments: Test A < 100%;Confidence limits are unreliabl

 04902562  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal
```

Thunder Bay GS (continued)

```
04903246  sampled: 08/27/90     LC50:       34.1 %
  95% fid. limits:    0.0 -   0.0 %
  comments: Confidence limits are unreliable

01900199  sampled: 09/12/90     LC50:       51.0 %
  95% fid. limits:   40.0 -  65.0 %
  comments: MISA Audit

04903864  sampled: 09/24/90     LC50:       80.6 %
  95% fid. limits:    0.0 -   0.0 %
  comments: Confidence limits are unreliable

04904490  sampled: 10/22/90     LC50:       80.6 %
  95% fid. limits:    0.0 -   0.0 %
  comments: Confidence limits are unreliable

04905075  sampled: 11/19/90     LC50:        8.4 %
  95% fid. limits:    0.0 -   0.0 %
  comments: Confidence limits are unreliable
```

Rain Gauge

Intake Water

```
04901872  sampled: 06/25/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

04902563  sampled: 07/23/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: non-lethal

04903247  sampled: 08/27/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

04903867  sampled: 09/24/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

04904491  sampled: 10/22/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

04905076  sampled: 11/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: non-lethal
```

Thunder Bay GS (continued)

Unit 2A Condensor CW

Unit 2B Condensor CW

Unit 3A Condensor CW

Unit 3B Condensor CW

COMPANY: Thunder Bay GS, Thunder Bay
(1841907)
SECTOR: Electric Power Generation
REGION: Northwest

SUMMARY

Daphnia magna acute lethality toxicity test data for six Intake Water and 26 effluent samples collected between June and November 1990 were submitted by the Thunder Bay Generating Station in Thunder Bay.

Five of six Intake Water (1700) samples were not acutely lethal to Daphnia and only one animal died in the other test.

One sample from the CCW Outfall (100) was not acutely lethal and a second sample had 48 h LC50 > 100%. Five of six samples from the Ash Transport System (200) were not acutely lethal and one sample had an LC50 > 100%. A Ministry audit sample collected in September was not acutely lethal. Similarly, five of six samples from the Oily Water Separator (1100) were not acutely lethal and one sample had an LC50 > 100%. The Ministry audit sample from this outfall had an LC50 > 100%, and many neonates were trapped in an oily surface film in all concentrations over 5%.

One of six samples from the WTP Neutral Sump (1500) was not acutely toxic. The five remaining samples had 48 h LC50s ranging from 1.4 to 88.4%. The Ministry audit sample collected in September had an LC50 between 30 and 60%.

All six effluent samples from Boiler Blowdown Units 2 (500) and 3 (600) were toxic to Daphnia. 48 h LC50s ranged between 54.0 and 82.2%, and most mortality data was consistent with ionic stress typical of low conductivity samples. It appears some other factors may be contributing to the toxicity of these samples.

CCW Outfall

04903241 sampled: 08/27/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100%

04905071 sampled: 11/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

Thunder Bay GS (continued)

Ash Transport System

```
04901868  sampled: 06/25/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: non-lethal

04902559  sampled: 07/23/90     LC50:   >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments: 3 dead @ 100%; 2 dead @ 65% @ 48 hrs.

04903242  sampled: 08/27/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

02900197  sampled: 09/12/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: MISA Audit

04903866  sampled: 09/24/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

04904487  sampled: 10/22/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

04905072  sampled: 11/19/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: non-lethal
```

Boiler Blowdown Unit 2

```
04901869  sampled: 06/25/90     LC50:        80.6 %
  95% fid. limits:     0.0 -    0.0 %
  comments:

04903243  sampled: 08/27/90     LC50:        82.2 %
  95% fid. limits:     0.0 -    0.0 %
  comments:

02900198  sampled: 09/12/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: MISA Audit; Very Low Conductivity

04903868  sampled: 09/24/90     LC50:        54.0 %
  95% fid. limits:    45.8 -   63.5 %
  comments:

04904488  sampled: 10/22/90     LC50:        69.4 %
  95% fid. limits:    59.6 -   80.6 %
  comments:
```

```
              Thunder Bay GS (continued)

 04905073  sampled: 11/19/90     LC50:      69.4 %
   95% fid. limits:   59.6 -  80.6 %
   comments:

Boiler Blwdn-Unit 3

 04902560  sampled: 07/23/90     LC50:      82.2 %
   95% fid. limits:    0.0 -   0.0 %
   comments:

Coal Pile Runoff

EC Boiler Wash/Clean

EC Air Preheater Wash

EO Surge Tank Overflow

Oily Water Seperator

 04901870  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 04902561  sampled: 07/23/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: anomolous data set; control mortality = 8%

 04903244  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal

 02900200  sampled: 09/12/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Many floaters in conc. 15 to 100%

 04903865  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04904489  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 04905074  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: non-lethal
```

Thunder Bay GS (continued)

SW Combustion Turbine

SW Roadway Drains

WTP Neut. Sump

04901871 sampled: 06/25/90 LC50: 1.4 %
95% fid. limits: 0.0 - 0.0 %
comments:

04902562 sampled: 07/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04903246 sampled: 08/27/90 LC50: 80.6 %
95% fid. limits: 0.0 - 0.0 %
comments:

02900199 sampled: 09/12/90 LC50: 30.0 - 60.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Very low pH.

04903864 sampled: 09/24/90 LC50: 88.4 %
95% fid. limits: 76.2 - 102.4 %
comments:

04904490 sampled: 10/22/90 LC50: 30.2 %
95% fid. limits: 23.4 - 38.8 %
comments:

04905075 sampled: 11/19/90 LC50: 5.9 %
95% fid. limits: 4.9 - 6.9 %
comments: A-test <10%

Rain Gauge

Intake Water

04901872 sampled: 06/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04902563 sampled: 07/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 1 dead @ 100% @ 48 hrs.

04903247 sampled: 08/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Thunder Bay GS (continued)

04903867 sampled: 09/24/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04904491 sampled: 10/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04905076 sampled: 11/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

Unit 2A Condensor CW

Unit 2B Condensor CW

Unit 3A Condensor CW

Unit 3B Condensor CW

Nuclear

Generating Stations

COMPANY: Bruce NGS - A, Tiverton
(1844208)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Rainbow trout acute lethality toxicity test data for 4 Intake Water samples and 18 Effluent samples collected between June and November 1990 were submitted by Bruce Nuclear Generating Station - A of Tiverton.

The four Intake Water (1500) and two CCW-Outfall (1000) samples were not acutely lethal to trout.

Two of four samples from the *** RLWM Tanks (100) were non-lethal and two samples were toxic with 96 h LC50s of 10 and 15.4% effluent.

Three of four samples from Boiler Blowdown Unit 3 (800) had lc50s > 100% effluent and a fourth sample was lethal woth an LC50 = 80.6%. One sample from Boiler Blowdown Unit 4 was non-lethal and a second sample had an LC50 > 100%.

All six samples collected from the WTP Neutral Sump were acutely lethal to trout with 96 h LC50s between 3.9 and 14.1% effluent.

```
*** RLWM Tanks

 14901042  sampled: 08/27/90     LC50:       15.4 %
   95% fid. limits:    11.0 -   19.3 % slope:      5.6
   comments:

 14901054  sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments:

 14901069  sampled: 10/22/90     LC50:       10.0 %
   95% fid. limits:     0.0 -    0.0 %
   comments: 100% mort. in 10%. LC50<10%  control=20 f/15L

 14901091  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments:
```

Bruce NGS - A (continued)

```
BE-Rh Drain-U1

BE-Rh Drain-U2

BE-Rh Drain-U3

BE-Rh Drain-U4

Boiler Blwdn-U1

Boiler Blwdn-U2

Boiler Blwdn-U3

 14901008  sampled: 06/25/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901053  sampled: 09/24/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901066  sampled: 10/22/90     LC50:      80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: small fish size, control= 20 fish/15L

 14901086  sampled: 11/19/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

Boiler Blwdn-U4

 14901025  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901041  sampled: 08/27/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

CCW-Outfall

 06901270  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901953  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Bruce NGS - A (continued)

Oily Water Separator

SW-Manhole 35

WTP Neut. Sump

```
06900793  sampled: 06/25/90     LC50:        6.3 %
  95% fid. limits:    5.3 -   7.3 %
  comments: MULTIPLY CONDUCTIVITY IN THE 100% BY 10

06901003  sampled: 07/23/90     LC50:        7.1 %
  95% fid. limits:    5.0 -  10.0 %
  comments: 100% MORTALITY IN THE 10% CONCENTRATION

06901272  sampled: 08/27/90     LC50:       14.1 %
  95% fid. limits:   10.0 -  20.0 %
  comments: 100% MORTALITY IN THE 20% CONCENTRATION

06901475  sampled: 09/24/90     LC50:        5.9 %
  95% fid. limits:    5.0 -   7.0 %
  comments: MULTIPLY CONDUCTIVITY IN THE 100% CONC. BY 10

06901759  sampled: 10/22/90     LC50:        3.9 %
  95% fid. limits:    3.0 -   5.0 %
  comments: MULTIPLY THE CONDUCTIVITY IN THE 100% BY 10

06901951  sampled: 11/19/90     LC50:        7.1 %
  95% fid. limits:    5.0 -  10.0 %
  comments: 100% MORTALITY IN THE 10% CONCENTRATION
```

Intake Water

```
06901268  sampled: 08/27/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901477  sampled: 09/24/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901757  sampled: 10/22/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901949  sampled: 11/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Bruce NGS - A (continued)

Rain Gauge

EC-Boiler Layup Unit 1

EC-Boiler Layup Unit 2

EC-Boiler Layup Unit 3

EC-Boiler Layup Unit 4

COMPANY: Bruce NGS - A, Tiverton
(1844208)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Daphnia magna acute lethality toxicity test data for eighteen effluent samples and four Intake Water samples collected between June and November 1990 were submitted by Bruce Nuclear Generating Station - A of Tiverton.

Four samples of Intake Water (1500), and two samples from CCW-outfall (1000) were not acutely lethal to Daphnia.

Two samples from Boiler Blowdown U4 (900) had 48 h LC50s > 100%. Two of four samples from Boiler Blowdown U3 (800) had 48 h LC50s > 100% and one sample was not acutely lethal. One sample had a 48 h LC50 = 94.9%. The conductivity of these samples was very low and much of the observed mortality could be due to osmotic stress.

Two of four samples from the RLWM Tanks (100) were not acutely lethal, but two other samples were toxic, with 48 h LC50s < 10%.

All six samples from the WTP Neutral Sump (2000) were acutely lethal to Daphnia. Five of six samples had 48 h LC50s < 10%. Free ion concentrations in many of these samples was very high, with conductivity measurements > 99,999 umohs.

```
*** RLWM Tanks

 14902042  sampled: 08/27/90     LC50:        9.2 %
   95% fid. limits:     6.0 -   14.0 %
   comments:

 14902054  sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments:

 14902069  sampled: 10/22/90     LC50:        2.4 %
   95% fid. limits:     0.0 -    5.1 % slope:     2.5
   comments: 48 hrs: 9 immobile in 5 %

 14902091  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments:
```

Bruce NGS - A (continued)

```
BE-Rh Drain-U1

BE-Rh Drain-U2

BE-Rh Drain-U3

BE-Rh Drain-U4

Boiler Blwdn-U1

Boiler Blwdn-U2

Boiler Blwdn-U3

 14902008  sampled: 06/25/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902053  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902066  sampled: 10/22/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902086  sampled: 11/19/90     LC50:      94.9 %
   95% fid. limits:   90.0 - 100.0 %
   comments:

Boiler Blwdn-U4

 14902025  sampled: 07/23/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902041  sampled: 08/27/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

CCW-Outfall

 06901271  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901954  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Bruce NGS - A (continued)

Oily Water Separator

SW-Manhole 35

WTP Neut. Sump

```
06900794  sampled: 06/25/90     LC50:        1.9 %
  95% fid. limits:    1.2 -   2.6 % slope:     5.0
  comments: MULTIPLY CONDUCTIVITY IN 100% BY 10.

06901004  sampled: 07/23/90     LC50:        5.6 %
  95% fid. limits:    4.6 -   6.7 %
  comments: CONDUCTIVITY TO BE MULTIPLIED BY 10 IN 100%

06901273  sampled: 08/27/90     LC50:        3.5 %
  95% fid. limits:    2.4 -   4.7 %
  comments: PARTIAL MORTALITY IN THE 3% AND 5% CONC.

06901476  sampled: 09/24/90     LC50:        4.9 %
  95% fid. limits:    3.8 -   6.7 %
  comments: MULTIPLY CONDUCTIVITY IN 100% CONC. BY 10

06901760  sampled: 10/22/90     LC50:        7.1 %
  95% fid. limits:    5.0 -  10.0 %
  comments: MULTIPLY COND. IN 100% AT 0 & 48 HR BY 10.

06901952  sampled: 11/19/90     LC50:       32.2 %
  95% fid. limits:   27.9 -  37.1 %
  comments: 40% MORTALITY IN THE 30% CONCENTRATION
```

Intake Water

```
06901269  sampled: 08/27/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901478  sampled: 09/24/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901758  sampled: 10/22/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901950  sampled: 11/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Bruce NGS - A (continued)

Rain Gauge

EC-Boiler Layup Unit 1

EC-Boiler Layup Unit 2

EC-Boiler Layup Unit 3

EC-Boiler Layup Unit 4

COMPANY: Bruce NGS - B, Tiverton
(1844307)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake Water and 20 Effluent samples collected between June and November 1990 were submitted by Bruce Nuclear Generating Station - B of Tiverton.

The six Intake Water (2100) and two CCW-Outfall (1400) samples were not acutely lethal to trout.

Five of six samples from each of the *** RLWM Tanks (100) and the WTP Neutral Sump (1400) were non-lethal. The August sample from The *** RLWM Tanks had an LC50 > 100%, and the June sample from the WTP Neutral Sump was lethal with an LC50 = 77.6% effluent. A Ministry audit sample collected from the WTP Neutral Sump in November was non-lethal.

Two samples collected from Boiler Blowdown Unit 6 (1100) were not acutely lethal to trout. One of two samples from Unit 7 (1200) was toxic with a 96 h LC50 = 80.6%, and the other had an LC50 > 100%. Both samples from Unit 8 (1300) HAD lc50S > 100% effluent.

*** RLWM Tanks

```
  14901043  sampled: 08/27/90     LC50:  >100  %
    95% fid. limits:    0.0 -   0.0 %
    comments:

  14901055  sampled: 09/24/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments:

  14901070  sampled: 10/25/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments:

  14901074  sampled: 10/30/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments:

  14901092  sampled: 11/19/90     non-lethal
    95% fid. limits:    0.0 -   0.0 %
    comments:
```

Bruce NGS - B (continued)

```
 14901093  sampled: 11/26/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

BE-Inac Dr-U5

BE-Inac Dr-U6

BE-Inac Dr-U7

BE-Inac Dr-U8

BE-Rh Dr-U5

BE-Rh Dr-U6

BE-Rh Dr-U7

BE-Rh Dr-U8

Boiler Blwdn-U5

Boiler Blwdn-U6

 14901024  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901088  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

Boiler Blwdn-U7

 14901009  sampled: 06/25/90     LC50:   >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901067  sampled: 10/22/90     LC50:       80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments:

Boiler Blwdn-U8

 14901040  sampled: 08/27/90     LC50:   >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901056  sampled: 09/24/90     LC50:   >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:
```

```
               Bruce NGS - B (continued)

 01900270  sampled: 11/28/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

CCW-Outfall

 06901284  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901957  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

SW-Manhole 1

SW-Manhole 28

SW-Manhole 8

WTP-Neut. Sump

 06900797  sampled: 06/25/90     LC50:      77.6 %
   95% fid. limits:   67.6 -  91.8 % slope:    12.1
   comments: MORTALITY IN THE 65 AND 100% CONCENTRATIONS

 06901007  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901282  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL MIPAIRMENT OBSERVED

 06901495  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901755  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901959  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900271  sampled: 11/28/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit
```

Bruce NGS - B (continued)

Intake Water

```
 06900795  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901005  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901280  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901473  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901753  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901955  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Rain Gauge

EC Boiler Layup U5

EC Boiler Layup U6

EC Boiler Layup U7

EC Boiler Layup U8

COMPANY: Bruce NGS - B, Tiverton
(1844307)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY
Daphnia magna acute lethality toxicity test data for nineteen effluent and six Intake Water samples collected between June and November 1990 were submitted by Bruce Nuclear Generating Station - B of Tiverton.

Two samples from each of Boiler Blowdown Units U6 (1100), U7 (1200), and U8 (1300), and CCW-outfall (1400) were not acutely lethal to Daphnia. A Ministry audit test on a sample collected from BB-U8 in November had a 48 h LC50 > 100%. Also, five of six samples of Intake Water (2100) were not acutely lethal, and one sample had a 48 h LC50 > 100%.

All five samples submitted for samples from the WTP Neutral Sump (2000) were not acutely lethal to Daphnia. One Ministry audit conducted on a sample collected in November had a 48 h LC50 > 100%.

Three of six samples from the RLWM Tanks (100) were not acutely lethal to Daphnia and 1 sample had a 48 h LC50 > 100%.

```
*** RLWM Tanks

 14902043  sampled: 08/27/90     LC50:      70.7 %
   95% fid. limits:   50.0 - 100.0 %
   comments:

 14902055  sampled: 09/24/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902070  sampled: 10/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902074  sampled: 10/30/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902092  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902093  sampled: 11/26/90     LC50:      80.4 %
   95% fid. limits:   69.8 -  97.6 %
   comments: 48hrs immobilities: 50%/3, 75%/9, 100%/10
```

Bruce NGS - B (continued)

```
BE-Inac Dr-U5

BE-Inac Dr-U6

BE-Inac Dr-U7

BE-Inac Dr-U8

BE-Rh Dr-U5

BE-Rh Dr-U6

BE-Rh Dr-U7

BE-Rh Dr-U8

Boiler Blwdn-U5

Boiler Blwdn-U6

 14902024  sampled: 07/23/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14902088  sampled: 11/19/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

Boiler Blwdn-U7

 14902009  sampled: 06/25/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14902067  sampled: 10/22/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

Boiler Blwdn-U8

 14902040  sampled: 08/27/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14902056  sampled: 09/24/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 02900270  sampled: 11/28/90      LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Very low conductivity
```

Bruce NGS - B (continued)

```
CCW-Outfall

 06901285  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901958  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

Oily Water Separator

SW-Manhole 1

SW-Manhole 28

SW-Manhole 8

WTP-Neut. Sump

 06901008  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901283  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901496  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901756  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06901960  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 02900271  sampled: 11/28/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Very high conductivity

Intake Water

 06900796  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Bruce NGS - B (continued)

```
 06901006  sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901281  sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901474  sampled: 09/24/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 30% MORTALITY IN THE 100% CONCENTRATION

 06901754  sampled: 10/22/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06901956  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

Rain Gauge

EC Boiler Layup U5

EC Boiler Layup U6

EC Boiler Layup U7

EC Boiler Layup U8
```

COMPANY: Darlington NGS, Bowmanville
(49001506)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Rainbow trout acute lethality toxicity test data for 5 Intake Water and 24 Effluent samples collected between June and November 1990 were submitted by Darlington Nuclear Generating Station of Bowmanville.

Three of five Intake Water (2400) samples were non-lethal and two samples had LC50s > 100% effluent.

Two CCW-Outfall (1800) and five Oily Water Separator (1900) samples were all not acutely lethal to trout.

Three of six samples from the *** RLWM Tanks (100) were not acutely lethal to trout, one sample had an LC50 > 100% and two samples were toxic with 96 h LC50s of 25.9 and 32.2% effluent.

Three of six samples from the Boiler Blowdown Unit 2 (1700) were non-lethal, two sample had LC50s > 100% and one sample was acutely lethal with a 96 h LC50 = 80.6%. A Ministry audit sample collected in November was non-lethal.

Four of five samples from the WTP- Neutral Sump (2200) were acutely lethal to trout with 96 h LC50s between 7.1 and 84.4% effluent. One sample was non-lethal. A Ministry audit sample collected in November was toxic with an LC50 = 51% effluent.

*** RLWM Tanks

14901001 sampled: 06/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

14901013 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

14901032 sampled: 08/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

14901046 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Darlington NGS (continued)

```
14901068  sampled: 10/23/90     LC50:       32.2 %
  95% fid. limits:   28.4 -   37.9 %
  comments: small fish size. control = 20 fish/15L

14901080  sampled: 11/05/90     LC50:       25.9
  95% fid. limits:   23.4 -   28.6
  comments:

BE-CSA Pump

BE-ESW Pumphouse

BE-HWMB

BE-U1 Pumphouse

BE-U2 Pumphouse

BE-U1 Sump A

BE-U1 Sump B

BE-U1 Sump C

BE-U1 Sump D

BE-U1 Sump E

BE-U2 Sump 1

BE-U2 Sump 2

BE-U2 Sump 3

BE-U2 Sump 4

BE-WTP

Boiler Blwdn U2

 14901002  sampled: 06/11/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901014  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901027  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:
```

```
              Darlington NGS (continued)

 14901045  sampled: 09/10/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14901060  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: fish shortage -1 bucket

 14901081  sampled: 11/05/90     LC50:      80.6 %
   95% fid. limits:    65.0 - 100.0 %
   comments:

 01900258  sampled: 11/14/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit

CCW-Outfall

 06901090  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901813  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

 06900952  sampled: 07/16/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901096  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901394  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901640  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901811  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900259  sampled: 11/14/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit
```

Darlington NGS (continued)

```
SW Manhole 214

SW Manhole 814

WTP-Neutral Sump

 06900896  sampled: 07/09/90     LC50:       14.1 %
   95% fid. limits:   10.0 -  20.0 %
   comments: 100% MORTALITY IN THE 20% CONCENTRATION

 06901092  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901392  sampled: 09/10/90     LC50:       70.2 %
   95% fid. limits:   63.0 -  78.1 %
   comments: 40% MORTALITY IN THE 65% CONCENTARTION

 06901659  sampled: 10/11/90     LC50:        7.1 %
   95% fid. limits:    5.0 -  10.0 %
   comments: 100% MORTALITY IN THE 10% CONCENTRATION

 06901809  sampled: 11/05/90     LC50:       84.4 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 90% MORTALITY IN THE 100% CONCENTRATION

 01900260  sampled: 11/14/90     LC50:       51.0 %
   95% fid. limits:   40.0 -  65.0 %
   comments: MISA Audit

Rain Gauge

Intake Water

 06900894  sampled: 07/09/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: 30% MORTALITY IN THE 100% CONCENTRATION

 06901094  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901390  sampled: 09/10/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: 10% MORTLITY IN THE 10% CONCENTRATION

 06901642  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Darlington NGS (continued)

```
 06901807  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

BE-U2 Sump 5

Boiler Blwdn Unit 1

EC HTG Steam Cond

Sewage Treatment Plant

COMPANY: Darlington NGS, Bowmanville
(49001506)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Daphnia magna acute lethality toxicity test data for four Intake Water samples and 16 effluent samples collected between June and November 1990 were submitted by Darlington Nuclear Generating Station of Bowmanville.

The six Intake Water (2400) samples were not acutely lethal to Daphnia. Similarly two samples from the CCW-outfall (1800) and five samples from the Oily Water Separator (1900) were not acutely lethal. A Ministry audit sample of effluent from the Oily Water Separator, collected in November, was not acutely lethal.

Three of six samples from the RLWM Tanks (100) were not acutely lethal and one sample had a 48 h LC50 > 100%. Two samples were toxic to Daphnia, with 48 h LC50s of 18.8 and 24.2% effluent.

Two samples from the WTP Neutral Sump (2200) was not acutely lethal to Daphnia and one sample had an LC50 > 100%. The remaining sample was toxic with a 48 h LC50 = 6.7%. A Ministry audit sample collected in November had an LC50 between 30 and 60%.

Two of six samples of Boiler Blowdown Effluent from Unit 2 (1700) were not acutely lethal to Daphnia and two samples had 48 h LC50s > 100%. A Ministry audit sample collected in November was not acutely lethal to Daphnia.

```
*** RLWM Tanks

 14902001  sampled: 06/11/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902013  sampled: 07/09/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902032  sampled: 08/08/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902046  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:
```

Darlington NGS (continued)

```
 14902068  sampled: 10/23/90     LC50:       18.8 %
   95% fid. limits:   13.3 -  25.4 % slope:     4.3
   comments: immobilities 48hrs:6% /4, 14% /8, 26% /10

 14902080  sampled: 11/05/90     LC50:       24.2 %
   95% fid. limits:   17.0 -  33.7 % slope:     3.7
   comments:

BE-CSA Pump

BE-ESW Pumphouse

BE-HWMB

BE-U1 Pumphouse

BE-U2 Pumphouse

BE-U1 Sump A

BE-U1 Sump B

BE-U1 Sump C

BE-U1 Sump D

BE-U1 Sump E

BE-U2 Sump 1

BE-U2 Sump 2

BE-U2 Sump 3

BE-U2 Sump 4

BE-WTP

Boiler Blwdn U2

 14902002  sampled: 06/11/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902014  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902027  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:
```

```
              Darlington NGS (continued)

 14902045  sampled: 09/10/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902060  sampled: 10/09/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 48hrs:7 immobile in 100%

 14902081  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 02900258  sampled: 11/14/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non-lethal

CCW-Outfall

 06901091  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901814  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

Oily Water Separator

 06900953  sampled: 07/16/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901097  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901395  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901641  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901812  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 02900259  sampled: 11/14/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non-lethal
```

Darlington NGS (continued)

SW Manhole 214

SW Manhole 814

WTP-Neutral Sump

```
 06901093  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901393  sampled: 09/10/90     LC50:  >100  %
   95% fid. limits:    0.0 -    0.0 %
   comments: 40% MORTALITY IN THE 100% CONCENTRATION

 06901660  sampled: 10/11/90     LC50:        6.7 %
   95% fid. limits:    5.9 -    7.4 %
   comments: 10% MORTALITY IN THE 5% CONCENTRATION

 06901810  sampled: 11/05/90     LC50:  >100  %
   95% fid. limits:    0.0 -    0.0 %
   comments: 40% MORTALITY IN THE 100% CONCENTRATION

 02900260  sampled: 11/14/90     LC50:      30.0 -   60.0   %
   95% fid. limits:    0.0 -    0.0 %
   comments: MISA Audit; high conductivity, low pH
```

Rain Gauge

Intake Water

```
 06900895  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901095  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901391  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901643  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901808  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Darlington NGS (continued)

BE-U2 Sump 5

Boiler Blwdn Unit 1

EC HTG Steam Cond

Sewage Treatment Plant

COMPANY: Pickering NGS A & B, Pickering
(1840206)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake Water and 51 Effluent samples collected between June and November 1990 were submitted by Pickering Nuclear Generating Stations A & B of Pickering.

The six Intake Water () samples collected were not acutely lethal to trout. Similarly the two samples collected from each of CCW-U 3a (1900), CCW-U 4a (2000), CCW-U 1&2 - a (2100), CW-AIFB (2200), CW-RBSW-NGS-A (2300), CW-Sulzer A (2500), CW-UPP (2600), CW-NGS-B (), and Sulzer B () were non-lethal. Two samples from CW-RBSW-NGS-B were acutely lethal to trout with 96 h LC50s of 52.8 and 59% effluent.

Four of six samples from the *** RLWM Tanks A (200) were non-lethal, one sample had an LC50 > 100%, and the sample collected in November was lethal with a 96 h LC50 = 80.6%.

Nine of eleven samples from Boiler Blowdown Units 1 (1100), 2 (1200), 5 (1500), 6 91600), 7 (1700) and 8 (1800) were acutely lethal to trout with 96 h LC50 values ranging between 30 and 90.2% effluent. The two remaining samples had LC50s > 100%.

Three of five samples from the WTP Neutral Sump () were non-lethal, one sample had and LC50 > 100%, and the August sample was lethal with a 96 h LC50 = 14.1%. A Ministry audit sample collected in October was non-lethal.

Three of five samples from the Oily Water Separator (2700) were not acutely lethal to trout, as was a Ministry audit sample collected in October. Two other samples had LC50s > 100% effluent. Three of four samples from Oily Water Separator A () were non-lethal and one sample was toxic with a 96 h LC50 = 80.6%.

BE-Unit 8

*** RLWM Tanks A

14901003 sampled: 06/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Pickering NGS A & B (continued)

```
 14901017  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901030  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901049  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901061  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Fish Shortage : -1 bucket. 10 fish/Control

 14901076  sampled: 11/05/90     LC50:       80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 96 hrs, 65 % : 9 fish immobile

*** RLWM Tanks B

BE-U1

BE-U2

BE-U3

BE-U4

BE-U5

BE-U6

BE-U7

Boiler Blwdn-U1

 14901004  sampled: 06/11/90     LC50:       62.2 %
   95% fid. limits:   51.5 -  75.4 % slope:      8.2
   comments:

 14901077  sampled: 11/05/90     LC50:       90.2 %
   95% fid. limits:   85.1 -  95.4 %
   comments:
```

Pickering NGS A & B (continued)

```
Boiler Blwdn-U2

 14901015  sampled: 07/09/90     LC50:      79.7 %
   95% fid. limits:   77.1 -  82.3 %
   comments:

 14901047  sampled: 09/10/90     LC50:      67.9 %
   95% fid. limits:   56.6 -  81.3 %
   comments:

 14901062  sampled: 10/09/90     LC50:      80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: Fish shortage: -1 bucket. 10 control fish

Boiler Blwdn-U3

Boiler Blwdn-U4

Boiler Blwdn-U5

 14901005  sampled: 06/11/90     LC50:      42.8 %
   95% fid. limits:   36.7 -  49.7 %
   comments:

 14901063  sampled: 10/09/90     LC50:      64.3 %
   95% fid. limits:   50.8 -  81.2 %
   comments: Fish Shortage: -1 bucket. 10 fish/Control

Boiler Blwdn-U6

 14901016  sampled: 07/09/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14901078  sampled: 11/05/90     LC50:      30.0 %
   95% fid. limits:   25.5 -  35.2 %
   comments:

Boiler Blwdn-U7

 14901031  sampled: 08/06/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments:

Boiler Blwdn-U8

 14901048  sampled: 09/10/90     LC50:      80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments:
```

Pickering NGS A & B (continued)

```
CCW-U 3a

 06901080  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901829  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CCW-U 4a

 06901088  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901821  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CCW-U 1 & 2 - a

 06901062  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901823  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-AIFB

 06901084  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901911  sampled: 11/13/90     LC50:  >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments: 10% MORTALITY IN THE 30% CONCENTRATION

CW-RBSW-NGS-A

 06901066  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901907  sampled: 11/13/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Pickering NGS A & B (continued)

```
CW-RBSW-NGS-B

 06901068  sampled: 08/06/90     LC50:       59.0 %
   95% fid. limits:    55.2 -   63.0 %
   comments: 90% MORTALITY IN THE 65% CONCENTRATION

 06901909  sampled: 11/13/90     LC50:       52.8 %
   95% fid. limits:    47.8 -   58.1 %
   comments: 20% MORTALITY IN THE 50% CONCENTRATION

CW-Sulzer A

 06901072  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901903  sampled: 11/13/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-UPP

 06901082  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901825  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

 06900807  sampled: 06/25/90     LC50:  >100   %
   95% fid. limits:     0.0 -    0.0 %
   comments: MORTALITY AT 30, 50, 65, AND 100% CONC.

 06900958  sampled: 07/17/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901064  sampled: 08/06/90     LC50:  >100   %
   95% fid. limits:     0.0 -    0.0 %
   comments: 30% MORTALITY IN THE 100% CONCENTRATION

 06901380  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900232  sampled: 10/16/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: MISA Audit; Non-lethal
```

Pickering NGS A & B (continued)

```
 06901817  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-CB 70

SW-MAnhole 37

SW-Manhole 85

WTP-Neut. Sump

 06900756  sampled: 06/11/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 30% MORTALITY IN THE 100% CONCENTRATION

 06900890  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901086  sampled: 08/06/90     LC50:      14.1 %
   95% fid. limits:    10.0 -  20.0 %
   comments: 100% MORTALITY IN THE 20% CONCENTRATION

 06901378  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900233  sampled: 10/16/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Non-lethal

 06901831  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CCW-NGS-B

 06901078  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901827  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Pickering NGS A & B (continued)

```
Sulzer B

 06901074  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901905  sampled: 11/13/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

 06900754  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900888  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901076  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901376  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901654  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901819  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

Oily Water Separator A

 14901018  sampled: 07/09/90     LC50:      80.6 %
   95% fid. limits:   63.3 - 134.4 %
   comments:

 06901070  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901644  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Pickering NGS A & B (continued)

06901815 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

RLWM Tanks B

Equip. Clean. Effluent

COMPANY: Pickering NGS A & B, Pickering
(1840206)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Daphnia magna acute lethality toxicity test data for six Intake Water samples and 57 effluent samples collected between June and November 1990 were submitted by Pickering Nuclear Generating Station A&B of Pickering.

The six samples of Intake Water were not acutely lethal to Daphnia. Similarly, cooling water effluent samples from CCW-U 1&2a (2100), CCW-U 3a (1900), CCW-U 4a (2000), CW-AIFB (2200), CW-RBSW-NGS-A (2300), CW-Sulzer A (2500), CW-UPP (2600), CCW-NGS-B and Sulzer B were not acutely lethal to Daphnia. Of the cooling water effluents only the samples from CW-RBSW-NGS-B (2400) were consistently toxic with 48 h LC50s ranging from 6.7 to 51.8%.

The four effluent samples from the Oily Water Separator A were not acutely lethal.

One of six samples from the RLWM Tanks A (200) was not acutely lethal to Daphnia, and three samples had 48 h LC50s > 100%. Two samples were toxic to Daphnia with LC50s of 46.5 and 77.1%.

Five of six samples from the Oily Water Separator (2700) were not acutely lethal to Daphnia, and only one animal died in the sixth test. A Ministry audit sample collected in October had an LC50 > 100%.

Five of six samples from the WTP Neutral Sump were not acutely lethal to Daphnia, and one sample was toxic with a 48 h LC50 = 14.1%. A Ministry audit sample collected in October had an LC50 > 100%.

All eleven samples collected from Boiler Blowdown Units U1 (1100), U2 (1200), U5 (1500), U6 (1600), U7 (1700), and U8 (1800) were acutely lethal to Daphnia. Most of the mortality data was consistent with the ionic stress typical of these effluents, but a few samples indicated there might be other compounds associated with toxicity in these outfalls.

Pickering NGS A & B (continued)

```
BE-Unit 8

*** RLWM Tanks A

 14902003  sampled: 06/11/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902017  sampled: 07/09/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902030  sampled: 08/06/90     LC50:      77.1 %
   95% fid. limits:   63.2 -  93.1 %
   comments: alpha = 20

 14902049  sampled: 09/10/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: immobilities at 24 and 48 hrs; see note

 14902061  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902076  sampled: 11/05/90     LC50:      46.5 %
   95% fid. limits:   35.9 -  60.0 %
   comments:

*** RLWM Tanks B

BE-U1

BE-U2

BE-U3

BE-U4

BE-U5

BE-U6

BE-U7

Boiler Blwdn-U1

 14902004  sampled: 06/11/90     LC50:      28.7 %
   95% fid. limits:   21.9 -  37.9 % slope:     6.0
   comments:
```

Pickering NGS A & B (continued)

```
 14902033  sampled: 08/14/90     LC50:       70.7 %
   95% fid. limits:   65.0 - 100.0 %
   comments:

 14902077  sampled: 11/05/90     LC50:       89.4 %
   95% fid. limits:   80.0 - 100.0 %
   comments:

Boiler Blwdn-U2

 14902015  sampled: 07/09/90     LC50:       68.0 %
   95% fid. limits:   62.7 -  73.7 %
   comments:

 14902047  sampled: 09/10/90     LC50:       70.7 %
   95% fid. limits:   50.0 - 100.0 %
   comments: 24 hrs/50 % : 1 immobility

 14902062  sampled: 10/09/90     LC50:       69.4 %
   95% fid. limits:   65.8 -  73.2 %
   comments:

Boiler Blwdn-U3

Boiler Blwdn-U4

Boiler Blwdn-U5

 14902005  sampled: 06/11/90     LC50:       32.3 %
   95% fid. limits:   24.4 -  41.4 %
   comments:

 14902063  sampled: 10/09/90     LC50:       70.7 %
   95% fid. limits:   50.0 - 100.0 %
   comments:

Boiler Blwdn-U6

 14902016  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902078  sampled: 11/05/90     LC50:       50.1 %
   95% fid. limits:   41.8 -  59.9 %
   comments: alpha = 5
```

Pickering NGS A & B (continued)

Boiler Blwdn-U7

```
 14902031  sampled: 08/06/90     LC50:      82.0 %
   95% fid. limits:   61.0 - 110.2 %
   comments: alpha = 30
```

Boiler Blwdn-U8

```
 14902048  sampled: 09/10/90     LC50:      70.7 %
   95% fid. limits:   50.0 - 100.0 %
   comments:
```

CCW-U 3a

```
 06901081  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901830  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALIOTY OR IMMOBILITY OBSERVED
```

CCW-U 4a

```
 06901089  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901822  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

CCW-U 1 & 2 - a

```
 06901063  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORATLITY OR IMMOBILITY OBSERVED

 06901824  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

CW-AIFB

```
 06901085  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTLAITY OR IMMOBILITY OBSERVED

 06901912  sampled: 11/13/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Pickering NGS A & B (continued)

```
CW-RBSW-NGS-A

 06901067  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901908  sampled: 11/13/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CW-RBSW-NGS-B

 06901069  sampled: 08/06/90     LC50:      15.8 %
   95% fid. limits:   13.7 -  18.1 %
   comments: 80% MORTALITY IN THE 20% CONCENTRATION

 06901910  sampled: 11/13/90     LC50:       6.7 %
   95% fid. limits:    5.9 -   7.4 %
   comments: 10% MORTALITY IN THE 5% CONCENTRATION

CW-Sulzer A

 06901073  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901904  sampled: 11/13/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CW-UPP

 06901083  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901826  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

Oily Water Separator

 06900808  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OBSERVED DURING TEST PERIOD

 06900959  sampled: 07/17/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Pickering NGS A & B (continued)

```
   06901065  sampled: 08/06/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

   06901381  sampled: 09/10/90     LC50:  >100  %
     95% fid. limits:     0.0 -   0.0 %
     comments: 10% MORTALITY IN THE 100% CONCENTRATION

   06901682  sampled: 10/15/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

   02900232  sampled: 10/16/90     LC50:  >100  %
     95% fid. limits:     0.0 -   0.0 %
     comments: MISA Audit/Many floaters in lower conc.

   06901818  sampled: 11/05/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

 SW-CB 70

 SW-MAnhole 37

 SW-Manhole 85

 WTP-Neut. Sump

   06900757  sampled: 06/11/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

   06900891  sampled: 07/09/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

   06901087  sampled: 08/06/90     LC50:      14.1 %
     95% fid. limits:    10.0 -  20.0 %
     comments: 100% MORTALITY IN THE 20% CONCENTRATION

   06901379  sampled: 09/10/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

   06901657  sampled: 10/09/90     non-lethal
     95% fid. limits:     0.0 -   0.0 %
     comments: NO MORTALITY OR IMMOBILITY OBSERVED

   02900233  sampled: 10/16/90     LC50:  >100  %
     95% fid. limits:     0.0 -   0.0 %
     comments: MISA Audit
```

Pickering NGS A & B (continued)

```
 06901832  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CCW-NGS-B

 06901079  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901828  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

Sulzer B

 06901075  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901906  sampled: 11/13/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTTALITY OR IMMOBILITY OBSERVED

Intake Water

 06900755  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06900889  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901077  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901377  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901655  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901820  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Pickering NGS A & B (continued)

```
Rain Gauge

Oily Water Separator A

 14902018  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 06901071  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901645  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901816  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

RLWM Tanks B

Equip. Clean. Effluent
```

Facilities

Associated with

Nuclear Generating Stations

COMPANY: Bruce Heavy Water Plant, Tiverton (1844406)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Rainbow trout acute lethality toxicity test data for 2 Intake Water and 8 Effluent samples collected between June and November 1990 were submitted by Bruce Heavy Water Plant of Tiverton.

The two samples from each of Intake Water (900), and CCW-Outfall (200) were not acutely lethal to trout.

Five of six samples of Process Effluent (500) were non-lethal and one sample had a 96 h LC50 > 100% effluent.

A Ministry audit sample from the Effluent Lagoon (400) was non-lethal.

```
BE-Clarifier Bldg

CCW-Outfall

 06901274   sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901945   sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Carb Eq. Drain

Effluent Lagoon

 01900238   sampled: 10/23/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

Process Effluent

 06900791   sampled: 06/25/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 20% MORTALITY IN 100% CONCENTRATION

 06901009   sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Bruce Heavy Water Plant (continued)

```
 06901278  sampled: 08/30/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901487  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901743  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900239  sampled: 10/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

 06901947  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-SWTP

SW-L.P.

SW-N.F.

Intake Water

 06901276  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901943  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge
```

COMPANY: Bruce Heavy Water Plant, Tiverton
(1844406)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Daphnia magna acute lethality toxicity test data for eight effluent samples and two Intake Water samples collected between June and November 1990 were submitted by Bruce heavy Water Plant of Tiverton.

Two samples from CCW-outfall (200), six samples of Process Effluent (500) and two Intake Water (900) samples were not acutely lethal to Daphnia magna.

A Ministry audit of a sample of process effluent collected in October had a 48 h LC50 > 100%. A Ministry test on a sample from the Effluent Lagoon (400) was not acutely lethal to Daphnia. There were some sublethal effects in these tests, with many living test organisms found trapped in an oily surface film in the test vessels.

BE-Clarifier Bldg

CCW-Outfall

```
 06901275  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901946  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

EC-Carb Eq. Drain

Effluent Lagoon

```
 02900238  sampled: 10/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit/Floaters in all conc.
```

Process Effluent

```
 06900792  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901010  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Bruce Heavy Water Plant (continued)

```
 06901279  sampled: 08/30/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901488  sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901744  sampled: 10/22/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 02900239  sampled: 10/24/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit/Many floaters

 06901948  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

EC-SWTP

SW-L.P.

SW-N.F.

Intake Water

 06901277  sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901944  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

Rain Gauge
```

COMPANY: Bruce Nuc Power Dev't Services A&B, Tiverton (1840107)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Rainbow trout acute lethality toxicity test data for 26 effluent samples collected between June and November 1990 were submitted by Bruce Nuclear Power Development Services A&B of Tiverton.

Six samples collected from each of CE Blowdown A Lake (200), CE-NGSA (300) and CE-SP STPO (400) were all not acutely lethal to trout. Ministry audit samples for these three outfalls were also non-lethal.

Six samples collected from the Sewage Treatment Plant (100) were not acutely lethal to trout. The Ministry audit sample collected in November was toxic with a 96 h LC50 = 14.1%.

The two samples collected from CCW Outfall BNPDS (1500) were non-lethal.

A Ministry audit sample collected from the WTP neutral Sump (1400) was not acutely lethal.

Sewage Treatment Plant

```
06900803  sampled: 06/25/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900985  sampled: 07/23/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901286  sampled: 08/27/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901485  sampled: 09/24/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901745  sampled: 10/22/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900253  sampled: 11/07/90     LC50:      14.1 %
  95% fid. limits:   10.0 -  20.0 %
  comments: MISA Audit
```

```
 06901933  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CE Blwdn A Lake

 06900805  sampled: 06/25/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900981  sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901292  sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901479  sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901751  sampled: 10/22/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900254  sampled: 11/07/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

 06901939  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CE-NGSA

 06900801  sampled: 06/25/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900983  sampled: 07/23/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901290  sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901481  sampled: 09/24/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Bruce Nuc Power Dev't Services A&B (continued)

06901749 sampled: 10/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900255 sampled: 11/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non Lethal

06901935 sampled: 11/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CE-SP STPO

06900799 sampled: 06/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900987 sampled: 07/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901288 sampled: 08/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901483 sampled: 09/24/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901747 sampled: 10/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900256 sampled: 11/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non Lethal

06901941 sampled: 11/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Chem Waste Pond

SW-Chem Laydown

```
             Bruce Nuc Power Dev't Services A&B (continued)

SW-D Point Ditch

SW-E Bound Ditch

SW-NGS-A Switchyd

SW-NGS-B Switchyd

SW-Oil Unloading

Waste Disposal Site

WTP Neut. Sump

 01900257  sampled: 11/07/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non Lethal

CCW Outfall BNPDS

 06901294  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901937  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge
```

COMPANY: Bruce Nuc Power Dev't Services A&B, Tiverton (1840107)
SECTOR: Electric Power Generation
REGION: Southwest

SUMMARY

Daphnia magna acute lethality toxicity data for 21 samples taken between June 1990 from five discharge sites were submitted by Bruce Nuclear Power Development Services A&B of Tiverton. No samples from any outfall were received for the month of August.

The one sample from the CCW outfall BNPDS (1500) and all five samples from each of CE-SP STPO (400) and the sewage treatment plant (100) were not acutely lethal to Daphnia. One Ministry audit of a sample of sewage treatment plant effluent taken in November indicated this sample was acutely lethal to Daphnia with a 48 h LC50 = 1.8%

Four of five samples of effluent from CE blowdown A lake (200) were not acutely lethal to Daphnia. One sample collected in July had a 48 h LC50 = 90.6%, and a Ministry audit conducted in November indicated the sample was not acutely lethal.

Four of five samples from CE-NGSA (300) were not acutely lethal and one sample had a 48 h LC50 > 100%. A Ministry audit conducted in November indicated the sample to be not acutely lethal.

One test conducted by the Ministry on a sample from the WTP neutral sump (1400) indicated this sample was acutely lethal to Daphnia with an LC50 between 60 and 100% effluent.

Sewage Treatment Plant

```
06900804  sampled: 06/25/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06900986  sampled: 07/23/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901287  sampled: 08/27/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901486  sampled: 09/24/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

```
            Bruce Nuc Power Dev't Services A&B (continued)

 06901746  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 02900253  sampled: 11/07/90     LC50:        1.8 %
   95% fid. limits:    0.5 -   6.9 %
   comments: MISA Audit

 06901934  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTLITY OR IMMOBILITY OBSERVED

CE Blwdn A Lake

 06900806  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06900982  sampled: 07/23/90     LC50:       90.6 %
   95% fid. limits:   75.7 - 137.2 % slope:     7.4
   comments: PARTIAL MORTALITY IN THE 65% AND 100%

 06901293  sampled: 08/27/90     LC50:       92.5 %
   95% fid. limits:   65.0 -  99.9 %
   comments: UPPER CONFIDENCE LIMIT CANNOT BE CALCULATED

 06901480  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901752  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 02900254  sampled: 11/07/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non-lethal

 06901940  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CE-NGSA

 06900802  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06900984  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

```
                 Bruce Nuc Power Dev't Services A&B (continued)
 06901291  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901482  sampled: 09/24/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 10% MORTALITY IN THE 50% AND 100% CONC.

 06901750  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 02900255  sampled: 11/07/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non-lethal

 06901936  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CE-SP STPO

 06900800  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06900988  sampled: 07/23/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901289  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901484  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901748  sampled: 10/22/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 02900256  sampled: 11/07/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Non-lethal

 06901942  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Bruce Nuc Power Dev't Services A&B (continued)

EC-Chem Waste Pond

SW-Chem Laydown

SW-D Point Ditch

SW-E Bound Ditch

SW-NGS-A Switchyd

SW-NGS-B Switchyd

SW-Oil Unloading

Waste Disposal Site

WTP Neut. Sump

```
 02900257  sampled: 11/06/90     LC50:      60.0 - 100.0  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit; Very high conductivity
```

CCW Outfall BNPDS

```
 06901295  sampled: 08/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901938  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Rain Gauge

COMPANY: Chalk R. Nuc. Laboratories, Chalk River (2950301)
SECTOR: Electric Power Generation
REGION: Southeast

SUMMARY

Rainbow trout acute lethality toxicity test data for 15 Effluent samples collected between June and November 1990 were submitted by Chalk River Nuclear Laboratories of Chalk River.

Three samples from CW-Once Through Cooling Water (200) had LC50s > 100% effluent.

The one sample collected from the *** Waste Treatment Centre (100) was acutely lethal to trout with a 96 h LC50 = 14.1%.

Three of six samples from the pH Drain (400) were non-lethal, two samples had LC50s > 100%, and one sample had a 96 h LC50 = 80.6%.

All five samples from the Sanitary Sewer were acutely lethal to trout. LC50 values ranged between 9.8 and 80.6% effluent.

```
 *** Waste Tr Center

  14901073  sampled: 10/29/90     LC50:      14.1 %
    95% fid. limits:   10.0 -  20.0 %
    comments:

 CW-Once Through CW

  14901020  sampled: 07/16/90     LC50:  >100   %
    95% fid. limits:    0.0 -   0.0 %
    comments:

  14901034  sampled: 08/13/90     LC50:  >100   %
    95% fid. limits:    0.0 -   0.0 %
    comments:

  14901050  sampled: 09/24/90     LC50:  >100   %
    95% fid. limits:    0.0 -   0.0 %
    comments:
```

Chalk R. Nuc. Laboratories (continued)

EO

Ph Drain

```
 14901006   sampled: 06/25/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14901021   sampled: 07/16/90     LC50:   >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14901035   sampled: 08/13/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14901051   sampled: 09/24/90     LC50:   >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14901071   sampled: 10/29/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 14901083   sampled: 11/12/90     LC50:       80.6 %
   95% fid. limits:    65.0 - 100.0 %
   comments:
```

Sanitary Sewer

```
 14901019   sampled: 07/16/90     LC50:        9.8 %
   95% fid. limits:     8.5 -  11.2 %
   comments:

 14901036   sampled: 08/13/90     LC50:       51.0 %
   95% fid. limits:    50.9 -  50.9 %
   comments:

 14901052   sampled: 09/24/90     LC50:       30.0 %
   95% fid. limits:    26.1 -  34.4 %
   comments:

 14901072   sampled: 10/29/90     LC50:       80.6 %
   95% fid. limits:    65.0 - 100.0 %
   comments:

 14901084   sampled: 11/12/90     LC50:       38.0 %
   95% fid. limits:    33.2 -  43.3 %
   comments:
```

Chalk R. Nuc. Laboratories (continued)

SW-01 Stream

SW-03 Storm Sewer

SW-04 Storm Sewer

SW-05 Storm Sewer

WDS-02 Stream

WDS-Duke Stream

WDS-Perch Creek

Rain Gauge

Intake Water

COMPANY: Chalk R. Nuc. Laboratories, Chalk River (2950301)
SECTOR: Electric Power Generation
REGION: Southeast

SUMMARY

Data for sixteen Daphnia magna acute lethality toxicity tests conducted on samples of effluent collected from 4 separate sites between June and November 1990 were submitted by Chalk River Nuclear Laboratories of Chalk River.

Three samples of Once Through Cooling Water (200) and six samples from the pH Drain (400) were not acutely lethal to Daphnia.

One sample from the Waste Treatment Centre (100) was toxic to Daphnia with a 48 h LC50 of 20.3%.

All six samples collected from the Sanitary Sewer (500) were acutely lethal with 48 h LC50s ranging between 8.7 and 70.7%.

```
*** Waste Tr Center

 14902073  sampled: 10/29/90     LC50:       20.3 %
   95% fid. limits:   15.3 -  26.8 %
   comments: immobilites;see note

CW-Once Through CW

 14902020  sampled: 07/16/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902034  sampled: 08/13/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

 14902050  sampled: 09/24/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:

EO

Ph Drain

 14902006  sampled: 06/25/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments:
```

```
                Chalk R. Nuc. Laboratories (continued)

    14902021  sampled: 07/16/90     non-lethal
      95% fid. limits:    0.0 -   0.0 %
      comments:

    14902035  sampled: 08/13/90     non-lethal
      95% fid. limits:    0.0 -   0.0 %
      comments:

    14902051  sampled: 09/24/90     non-lethal
      95% fid. limits:    0.0 -   0.0 %
      comments:

    14902071  sampled: 10/29/90     non-lethal
      95% fid. limits:    0.0 -   0.0 %
      comments:

    14902083  sampled: 11/12/90     non-lethal
      95% fid. limits:    0.0 -   0.0 %
      comments: 48 hrs/ 100% : 1 immobility

   Sanitary Sewer

    14902007  sampled: 06/25/90     LC50:           8.7 %
      95% fid. limits:    7.9 -   9.6 %
      comments:

    14902019  sampled: 07/16/90     LC50:           8.7 %
      95% fid. limits:    7.9 -   9.6 %
      comments:

    14902036  sampled: 08/13/90     LC50:          26.2 %
      95% fid. limits:   20.3 -  33.6 %
      comments:

    14902052  sampled: 09/24/90     LC50:          36.1 %
      95% fid. limits:   26.0 -  50.0 %
      comments:

    14902072  sampled: 10/29/90     LC50:          70.7 %
      95% fid. limits:   50.0 - 100.0 %
      comments:

    14902084  sampled: 11/12/90     LC50:          51.0 %
      95% fid. limits:   40.0 -  65.0 %
      comments:
```

Chalk R. Nuc. Laboratories (continued)

SW-01 Stream

SW-03 Storm Sewer

SW-04 Storm Sewer

SW-05 Storm Sewer

WDS-02 Stream

WDS-Duke Stream

WDS-Perch Creek

Rain Gauge

Intake Water

COMPANY: Darlington-Construction, Bowmanville
(1840800)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Rainbow trout acute lethality toxicity test data for 6 Intake and 23 Effluent samples collected between June and November 1990 were submitted by Darlington-Construction of Bowmanville.

Five of six samples of Bowmanville water (1200) were not acutely lethal to trout and one sample had one animal die in the 100% concentration.

Two samples from the CW-Compressors (300) and six samples from the WTP-Neutral Sump (1100) were non-lethal. A Ministry audit sample from the WTP-Neutral Sump was also non-lethal.

Five of six samples from Sewage Treatment (800) were non-lethal and one sample had an LC50 > 100%. A Ministry audit sample collected in October was acutely lethal to trout with a 96 h LC50 = 7.1% effluent.

All three samples collected from the *** TRF Boiler Blowdown (100) were acutely lethal to trout with LC50s ranging between 80.6 and 90.6% effluent.

Five of six samples from the Boiler Blowdown Effluent (200) were toxic to trout with 96 h LC50s between 14.9 and 80.6% effluent. One sample was non-lethal, as was a Ministry audit sample collected in October.

```
*** TRF Boiler Blwdn

 06900880  sampled: 07/09/90     LC50:       90.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 70% MORTALITY IN THE 100% CONCENTRATION

 06901044  sampled: 08/06/90     LC50:       80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 100% MORTALITY IN THE 100% CONCENTRATION

 06901402  sampled: 09/10/90     LC50:       84.5 %
   95% fid. limits:   70.0 -  99.4 % slope:    10.0
   comments: PARTIAL MORTALITY IN THE 65% AND 100% CONC.
```

Darlington-Construction (continued)

```
Boiler Blwdn eff

 06900710  sampled: 06/11/90     LC50:       30.3 %
   95% fid. limits:   23.1 -  38.3 % slope:     4.7
   comments: 20% MORTALITY IN THE 20% CONCENTRATION

 06900884  sampled: 07/09/90     LC50:       14.9 %
   95% fid. limits:   13.4 -  16.5 %
   comments: 90% MORTALITY IN THE 20% CONCENTRATION

 06901046  sampled: 08/06/90     LC50:       15.8 %
   95% fid. limits:   13.7 -  18.1 %
   comments: 80% MORTALITY IN THE 20% CONCENTRATION

 06901400  sampled: 09/10/90     LC50:       80.6 %
   95% fid. limits:   65.0 - 100.0 %
   comments: 100% MORTALITY IN THE 100% CONCENTRATION

 06901646  sampled: 10/09/90     LC50:       58.2 %
   95% fid. limits:   41.5 -  94.9 % slope:     2.8
   comments: PARTIAL MORTALITY IN 30, 50, 65, & 100% CONC.

 01900242  sampled: 10/30/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

 06901801  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-compressors

 06901050  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901805  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Lagoon 1

EC-Lagoon 2

EC-Tank 2
```

Darlington-Construction (continued)

```
EC-Tank 4

Sewage Treatment

 06900716  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900882  sampled: 07/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901040  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901398  sampled: 09/10/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: 10% MORTALITY IN THE 30% CONCENTRATION

 06901650  sampled: 10/09/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900243  sampled: 10/30/90     LC50:       7.1 %
   95% fid. limits:     5.0 -  10.0 %
   comments: MISA Audit

 06901839  sampled: 11/05/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-Se Corner

SW-Shops Warehouse

WTP-Neutral Sump

 06900714  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06900970  sampled: 07/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901042  sampled: 08/06/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Darlington-Construction (continued)

```
06901404  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901652  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MULTIPLY CONDUCTIVITY IN 50, 65 & 100% BY 10

01900244  sampled: 10/30/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit

06901803  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Bowmanville water

```
06900712  sampled: 06/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900886  sampled: 07/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901048  sampled: 08/06/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901396  sampled: 09/10/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: 10% MORTALITY IN THE 10% CONCENTRATION

06901648  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901799  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

Settlement Pond

Rain Gauge

Darlington-Construction (continued)

COMPANY: Darlington-Construction, Bowmanville (1840800)
SECTOR: Electric Power Generation
REGION: Central

SUMMARY

Daphnia magna acute lethality toxicity test data for 6 Intake Water samples and 23 effluent samples collected between June and November 1990 were submitted by Darlington Construction of Bowmanville.

The six samples of Bowmanville Water (1200) were not acutely lethal to Daphnia. Similarly six samples of Sewage Treatment Effluent (800) and two samples from the CW-compressors (300) were not acutely lethal. A Ministry audit sample of Sewage Treatment effluent collected in October was toxic to Daphnia with a 48 h LC50 between 1 and 5%.

One of six samples from the WTP Neutral Sump (1100) was not acutely lethal to Daphnia, and one sample had a 48 h LC50 > 100%. The remaining four samples had LC50s ranging between 46.5 and 90.1%. A Ministry audit sample collected in October was not acutely lethal to Daphnia.

Three samples from the TRF Boiler Blowdown (100) were acutely toxic to Daphnia with 48 h LC50s ranging between 50.2 and 80.6%. Two of six samples of Boiler Blowdown Effluent (200) were not acutely lethal to Daphnia and one sample had a 48 h LC50 > 100%. The three remaining samples had LC50s ranging between 15.8 and 54.5%. One Ministry audit sample collected in October was not acutely lethal to Daphnia. Conductivity measurements were very low in the 100% effluent concentrations, but mortality data is inconsistent with osmotic stress.

```
*** TRF Boiler Blwdn

 06900881  sampled: 07/09/90     LC50:       59.4 %
   95% fid. limits:    49.7 -   67.1 %
   comments: PARTIAL MORTALITY IN 50 AND 65% CONC.

 06901045  sampled: 08/06/90     LC50:       50.2 %
   95% fid. limits:    41.0 -   60.0 % slope:     7.0
   comments: PARTIAL MORTALITY IN 30%, 50%, AND 65% CONC.

 06901403  sampled: 09/10/90     LC50:       80.6 %
   95% fid. limits:    65.0 - 100.0 %
   comments: 100% MORTALITY IN THE 100% CONCENTRATION
```

```
                  Darlington-Construction (continued)

Boiler Blwdn eff

 06900711  sampled: 06/11/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OBSERVED DURING TEST PERIOD

 06900885  sampled: 07/09/90     LC50:      18.6 %
   95% fid. limits:   15.6 -  22.1 %
   comments: 50% MORTALITY IN THE 100% CONCENTRATION

 06901047  sampled: 08/06/90     LC50:      15.8 %
   95% fid. limits:   13.7 -  18.1 %
   comments: 80% MORTALITY IN THE 20% CONCENTRATION

 06901401  sampled: 09/10/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: 20% MORTALITY IN THE 100% CONCENTRATION

 06901647  sampled: 10/09/90     LC50:      54.5 %
   95% fid. limits:   45.2 -  64.6 %
   comments: PARTIAL MORTALITY IN THE 50% AND 65% CONC.

 02900242  sampled: 10/30/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

 06901802  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

CW-compressors

 06901051  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901806  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

EC-Lagoon 1

EC-Lagoon 2

EC-Tank 2
```

Darlington-Construction (continued)

```
EC-Tank 4

Sewage Treatment

 06900717  sampled: 06/11/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06900883  sampled: 07/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901041  sampled: 08/06/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901399  sampled: 09/10/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901651  sampled: 10/09/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 02900243  sampled: 10/30/90     LC50:        1.0 -    5.0  %
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

 06901840  sampled: 11/05/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

SW-Se Corner

SW-Shops Warehouse

WTP-Neutral Sump

 06900715  sampled: 06/11/90     LC50:       90.1 %
   95% fid. limits:   72.7 - 165.8 % slope:     5.5
   comments: 10% MORTALITY IN THE 50% CONCENTRATION

 06900971  sampled: 07/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED

 06901043  sampled: 08/06/90     LC50:  >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments: 40 % MORTALITY IN THE 100% CONCENTRATION
```

Darlington-Construction (continued)

```
06901405  sampled: 09/10/90     LC50:       88.5 %
  95% fid. limits:   75.5 - 111.4 % slope:    10.2
  comments: PARTIAL MORTALITY IN THE 65% AND 100% CONC.

06901653  sampled: 10/09/90     LC50:       46.5 %
  95% fid. limits:   40.1 -  56.6 %
  comments: MULTIPLY CONDUCTIVITY IN 50, 65, & 100% BY 10

02900244  sampled: 10/30/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit

06901804  sampled: 11/05/90     LC50:       53.9 %
  95% fid. limits:   41.7 -  73.6 % slope:     3.7
  comments: PARTIAL MORTALITY IN 20, 30, 50, AND 65% CONC
```

Bowmanville water

```
06900713  sampled: 06/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06900887  sampled: 07/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901049  sampled: 08/06/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901397  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901649  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06901800  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

Settlement Pond

Rain Gauge

Darlington-Construction (continued)